The Scientific Review,

AND

SCIENTIFIC AND LITERARY REVIEW,

A RECORD OF PROGRESS IN ARTS, INDUSTRY, AND MANUFACTURES,

INCORPORATING THE

Journal of the Inventors' Institute.

REGISTERED FOR TRANSMISSION ABROAD.]

[ALL RIGHTS RESERVED.

Vol. XVII.—No. 6.] JUNE 10, 1882. [Price 6d.

SUBJECT MATTER INDEX OF APPLICATIONS FOR PATENTS.

April 21st to May 20th inclusive.

The following Index gives first the class, then the name of the Inventor, and No. of the application. In this list (com.) means Invention communicated from abroad. Further information as to the progress of these Patents by Notice to Proceed, Sealing, and Specifying, can be obtained at the Office, 21, Cockspur Street, Charing-cross.

Acids.—W. Brookes (com.), 2193. G. Prim, 2224. T. Webb, 2372.

Advertising, Advertisements, &c.—F. H. F. Engel (com.), 1930. J. Hickisson, 2112. E. P. Alexander (com.), 2169.

Aerated Liquids, Mineral Waters, Aerating, &c.—J. Forbes, 2012. J. Prosser, 2376.

Air, Gas and Wind Engines, and Mills, Pneumatic Motive Power.—S. Skinner, 1910. T. C. Glaser (com.), 2008. C. M. Sombart, 2057. A. N, Porteons, 2058. J. Buckett, 2075. S. Warssam, 2126. T. Charlton and J. Wright, 2166. S. Clayton, 2202. B. Russ, 2231. O. Mobbs, 2257. W. B. Hutchinson, 2329. H. Guthrie, 2337. W. Watson, 3342. S. and H. N. Bickerton, 2345.

Air, Gases, and Vapours (Pumping, Forcing, Exhausting, Compressing, &c.)—T. Thorp, 2024. D. Johnson and S. C. Tisley, 2129. C. H. Guningham, 2375.

Alkalies (Soda, Potash, Lithia, Ammonia.)—S. Pitt (com.), 2110.

Aluminium (Salts), Alumina, Alum, &c.—W. R. Lake (com.), 1941.

Ambulance, &c.—H. Hides (com.), 1963.

Armour Plates, &c.—A. Wilson, 2130.

Axes, &c —R. P. Yates, 1931.

Axles, Shafts, Bearings, Journals, Axle Boxes, &c.—W. R. Lake (com.), 1934. E. Button, 2137. C. Truman, 2326. J. Gordon, 2382.

Bags, Portmanteaus, Sacks, Holders, Satchels, Reticules, Knapsacks, Valises, &c.—H. J. Haddan (com.), 2098. H. J. Haddan (com.), 2206.

Bands, Belts, Straps, Chains, and Ropes for Driving Machinery, Belt Shippers, &c.—B. Marsden (com.), 2358.

Beverages, Liqueurs &c.—W. A. Barlow (com.), 2323. J. Prosser, 2376.

Bobbins, Spools, Reels, Cop-tubes, &c.—A. J. Boult (com.), 2249. W. R. Lake (com.), 2374.

Boilers, Coppers, Kiers, &c.—S. Jones, 2241.

Bone, Horn, Ivory, &c.—A. C. Henderson, 2294.

Boots, Shoes, Leggings, Clogs, Cleaning Boots, Boot-jacks, &c.—D. and N. Fraser, 2010. W. J. Walden, 2016. J. Handford, 2041. J. Keats, 2055. J. Hinks, 2301. P. M. Justice (com.), 2325. L. Patin, 2373.

Boring, Drilling, and Rifling, Gimlets, Augers, Drills, Reamers, Boring Bits, Ratchet and other Braces.—J. Uurwin, 2251.

Bottles, Bottle-stoppers, Capsules, Bottling and Decanting Liquids, Stopping and Opening Bottles, &c.—J. Ballard, 1898. J. Burdin, 1992. J. Busser, 2062. A. M. Clark (com.), 2160. P. Murat and A. Motet, 2188. C. M. Sombart (com.), 2280.

Boxes, Cases, Bins, Chests, Trunks, &c.—H J. Haddan, 2123. A, Black, 2145. W. Newell and T. Tarlett, 2266. B. C. Scott, 2321.

Brackets, &c.—W. Randle, 1929.

Breaks for Railways, Tram Cars, and Road Carriages, &c.—A. Archer, 1964. T. W. Eames, 2227.

Brewing, Treating Malt, and Malt Liquors.—J. Forbes, 1012. J. Armstrong, 2014. B. J. Mills (com.), 2076. T. Webb, 2372.

Bricks, Tiles, and Building Blocks.—T. A. Riggs, 1916.

Bridges.—Arches, Viaducts, Aqueducts.—W. Wynne, 2047.

Brushes, Brooms, Mops.—A. Foster, 2179.

Building, Flooring and Roofing, Walls, and Ceilings, &c.—J. Noad and H. Salamon, 1959. J. Henson, 1974. J. M. Gray, 2157. J. Thallow, 2244. J. Barrett, 2357. W. R. Lake (com.), 2365.

Buttons, Studs, Sleeve Links, and other Dress Fasteners, Eyelets, Button Holes, Solitaires, &c.—W. Brewn, 1942. J. Rollason, 2002. W. R. Lake (com.), 2267.

Calculating, Figures, &c.—A. J. Boult (com.), 2119.

Candles, &c.—R. N. Gubbins and A. Thumling, 1997. W. Blundell, 2229. E. Edwards, (com.), 2347.

Cans, Canisters, Tins, Drums, &c.—T. H. George, 1976. J. Robinson, 1998.

Cards and Cardcases.—F. Steitz, 2105.

Carpets, &c.—W R. Lake (com.), 2343.

Carriages, Cabs, Omnibuses, Waggons, Carts, Trucks, Perambulators, Barrows, Loading, Unloading, and Tipping Carts, &c.—J. Whitehead, 1914. J. M. Justice (com.), 2053. E. Wright, 2173, G. W. von Nawrocki (com.), 2314. J. Preston, 2352. W. Mead, 2359.

Charcoal, Coke, Carbon, Lamp-black, Plumbago, &c.—R. de Saldanoff, 1950. J. Janeson, 1947. H. E. Jones, 2338. J. Ingham, 2339.

Cheques, and other Monetary Documents, Cheque-Books, Bank Notes, Forms, Bills, Receipts, Invoices, &c.—B. C. Scott, 2321.

Clocks, Watches, Chronometers and other Timekeepers, Watch Keys, &c.—H. Lake (com.), 1960. A. Harden, 2182. W. Llewellin, 2330.

Coffee, Cocoa, and Tea; Coffee-pots, Teapots, Urns, &c.—G. W. von Nawrocki (com.), 2067. W. Crispen, 2360.

Cooking, and Apparatus used in Cooking, &c. —F. Duggan, 2133.

Copying, Tracing, Drawing, Writing, Ruling Paper, &c.—M. Fisher, 2039.

Cutting, Sawing, Planing, and Carving, &c.—W. Crosland, 1926. R. Yates, 1931. C. D. Abel (com.), 1991. H. J, Haddan (com.), 2018. G. Richards, 2260.

Cylinders and Rollers, Covering Cylinders and Rollers.—D. Davies, 1939. J. Buchholz, 2054. E. Bolton, 2157. T. R. and T. W. Harding, 2252.

Dishes, Plates, Dishcovers, &c.—R. Bramwell, 2304.

Disinfecting, Deodorising, Fumigating Apparatus and Compositions, &c.—E. W. Bell (com.), 2077. C. Bowen and A. Miller, 2086. A. E. Robinson, 2308.

Distilling and Rectifying.—T. Webb, 2372.

Doors, Gates, and Door Furniture.—F. Dyer, 2001. J. H. Walsh and B. Spittle, 2022. S. Wilkins, 2066. J. Jensen (com.), 2107. H. Dennis, 2327.

Drains, Sewers, Gutters, Gratings, Gulleys, Ditches, Traps, Sinks, &c.—J. T. King, 2353. H. Kelly, 2377.

Dramatic and Theatrical Performances.—P. Jensen (com.), 2107.

Drying or Desiccating, Expelling Moistures, &c.—A. M. Clark (com.), 2303. J. M. Croisdale, 2486. G. W. von Nawrocki (com.), 2488. J. Aitken, 2534.

Dyes, and Printing Colours, Dyeing and Staining, &c.—J. A. Dixon, 1905. S. Musgrove, 1921, J. H. Loder, 2235.

Electricity, Galvanism, and Magnetism, and their Application.—A. R. Bennett, 1901. W. R. Lake (com.), 1940. C. V. Boys, 1946. T. Handford (com.), 1956. J. B. Rogers, 1999. W. R. Brougham, 2030. T. J. Handford (com.), 2052. J. H. Johnson (com.), 2065. G. Cathcart and C. Cole, 2068. P. Jensen (com.), 2107. K. Parzelski, 2125. W. Arthur, 2123. F. Cultrise, (com), 2135. A. Millar, 2138. T. Floyd and T. Hinkland, 2225. J. M. Stuart, 2232. T. Varley and H. B. Greenwood, 2248. A. Tribe, 2263. R. H. Simons, 2270. B. H. Chameroy, 2295. W. R. Lake (com.), 2298. J. Cumine, 2318. T. J. Handford (com.), 2336. C. W. Vincent (com.), 2340. S. H. Emmens, 2349. N. D. Spartali, 2387.

Electro-Magnetic Engines.—T. J. Handford, (com.), 2052. A. Millar, 2138. C. F. Varley, 2184. C. F. Varley, 2185. C. F. 2207. R. H. Simons, 2270. J. A. Cumine, 2318.

Engraving, and Etching, Producing Sunk Devices, &c.—T. R. Johnston, 2264.

Excavating and Dredging, Embankments an Tunnels, &c.—T. Russell, 2002,

Explosive Compounds, Nitro-cellulose, Pyroxyline, &c.—C. W. Siemens (com.), 1969.

Fabrics, Elastic Fabrics, &c.—J. Mugnier, 1927. E. Mansfield, 2021. T. Gardner (com.), 2029. J. Jaeger, 2122. A. Arnold, 2212.

Felt, Felted Fabrics, Fulling, Milling, &c.—H. Herand and W. Harrison, 2354.

Fences, Fencing, Hurdles, Railings, Palings &c.—C. Dawson, 2105. E. G. Rock (com.), 2319.

Ferrules, &c.—W. Beck (com.), 2261.

Fibres (Obtaining and Treating).—W. R. Lake (com), 1978. F. C. Glaser, 2287.

Filters; Filtering, Purifying, and Clarifying Liquids, Distilling Water, Softening Water.—G. Tidcombe, 1908. O. Bowen and A. Miller, 2086. P. and F. M. Spence, 2177.

Finishing and Dressing Woven Fabrics, Yarns, and Threads, &c.—C. D. Abel (com.), 1904. I. Tuffnell, 1925. H. W. and H. King, 1996.

Fire-Engines, Extinguishing Fires, &c.—J. R. Brown, 2049. P. Jensen (com.), 2107.

Fire-Escapes, &c.—T. H. Pinder, 1907. J. Gordon, 2281.

Fire-Places, Stoves and Ranges, Fenders and Fire-Irons, Fire-Guards, &c.—W. Salby, 1902. T. Fletcher, 2019. F. J. Duggan, 2133. W. Beazley, 2152. J. M. Gray, 2157. H. Greenhous, 2395.

Fire-proofing, &c.—S. B. Wilkins, 2066. R. Guelton, 2097. T. Hyatt, 2549. W. A. and G. E. Phillips, 2571. L. Varicas (com.), 2644.

Fishing, Fishing Tackle.—H. J. Haddan (com.), 2087.

Flues and Chimneys, &c.—T. E. Bladon, 1975. C. H. von Ullner, 2273. F. Livet, 2296. T. W. Harrett, 2357.

Fuel (Artificial), Fire-lighters, &c.—J. Templeman and T. Carmichael, 2095.

Furnaces and Fire-boxes, Supplying Furnaces with Fuel.—W. S. Cooper, 1935. W. Begg, 1966. H. H. Andrew, 1995, H. J. Haddan (com.), 2071. T. Lishman, 2082. W. Beazley, 2152. W. F. Batho (com.), 2181. J. H. Johnson (com.), 2238. H. C. Paterson, 2379. E. A. Cowper, 2381..

Furniture, Bedsteads, Tables, Cabinets, Chairs, Desks, Wardrobes, Upholstery, Cabinet-work, &c.—A. Young, 1932. C. Klemetson, 2099. G. Jaga, (com.), 2122. H. Carter, 2210. J. Hodgson, 2245. T. Welton, 2275. W. R. Lake (com.), 2299. W. R. Thompson, 2310. W. von Nawrocki, (com.), 2312. S. Isaacs, 2331. J. Cowan, 2332.

BRITISH MUSEUM

Gas (Making), &c.—J. C. Mewburn, (com.), 1918. H. J. Haddan (com.), 2071. W. Dick and G. S. Packer, 2151. W. F. Rather (com.), 2181. B. Russ, 2231.

Gas and other Burners, &c.—B. Sawdon, 1987. J. Fletcher, 2019, E. Hagen (com.), 2104. F. J. Duggan, 2133.

Gas Regulators, &c.—T. Thorp and T. G. Marsh, 2024.

Gauges, Water-level Indicators, Indicating &c.—J. R. Kenyon, 1985.

Glass (Making and Treating) and its Applications.—C. J. Bishop, 2025. H. J. Haddan (com.), 2277. J. Mitchell, 2202.

Gloves, Gauntlets, Mittens.—W. Brown, 1942. W. J. Waldkn, 2016. W. R. Lake (com.) 2267.

Governors for Engines and Machinery.—J. A. Buchholz, 2054.

Grain and Seeds (Treating, &c.)—W. Korth, 2214.

Grapnels, &c.—J. Anderson and W. H. Johnson, 2311.

Greenhouses, Hothouses, Conservatories, Forcing Pits, and Frames.—W. Willshaw, 2006.

Grinding, Crushing, and Disintegrating Corn, Grain and Seeds, and Dressing Flour.—J. A. Buchlwtz, 2054. J. Beal, 2149. A. D. Wreson, 2274. J. G. Bradstactle, 2367.

Grinding, Crushing, Pulverising and Disintegrating Miscellaneous Substances.—J. Goodman, 2117. W. Korth, 2214. T. R. and T. W. Harding 2252. R. Prentice, 2294.

Grinding and Sharpening, &c.—A. Payne, 2189.

Harness, Saddles, Curbs, Whips, Releasing from Harness, Grooming Horses, Nosebags.—H, H. Lake (com.), 1962. J. Heason and E. Hall, 2043. E. Wright, 2173. H. J. Haddan (com.), 2350.

Hats.—C. E. Naish (com.), 1965. H. J. Haddan (com.), 2088. S. Wtlde and H. Beech, 2191. H. Herand and W. Harrison, 2354.

Heating, Warming, and Evaporating, Obtaining and Regulating Heat, &c.—J. Keith, 1920. H. F. Taylor, 1954. H. H. Andrews, 1995. W. and J. Beesley, 2074. C. C. Stanford, 2132, J. Imray (com.), 2271. A. H. Hearington, 2275. W. T. Whiteman, 2300.

Hoists, Jacks, Lifts, Winches, Cranes, Capstans, Windlasses, Raising, Lowering and Moving Heavy Bodies, Raising from Mines.—W. L. Wise (com.), 1944. A. B. Brown, 2046. J. V. Hope, 2061. A. Gain, 2187. T. Perkins, 2230. Marquis of Ailsa, 2243. W. R. Lake (com.), 3246. W. H. Whetham, 2258. R. W. L. Reddie (com.), 2317. T. W. Barrett, 2357.

Hoops, &c.—T. Nash and W. Brewer, 1900.

Horse Shoes, Shoeing Horses, Shoes for Animals, &c.—R. Eames, 2162. A. Vanderkerken and J. Mans, 2175.

Inks, &c.—F. Benevenuti, 2306.

Jars, &c.—J. Bussay, 2062. V. Manuel, 2094.

Jewellery, &c.—J, Rollason, 2004.

Knitting, Looped Fabrics, Tatting, Crocheting, &c.—J. and H. Riddier, 2255.

Knives, Forks, Table Cutlery, Knife Cleaners, &c.—W. Merichenski, 2033. A. Payne, 2189. H. Woodward, 2217. C. H. Wood, 2427.

Lace.—J. Tuffnell, 1925.

Lamps, Lanterns, Chandeliers, Gaseliers, Lamp Furniture, Lighting and Extinguishing Lamps, Artificial Light, Producing Light, Candlesticks, Candelabra, &c.—H. Defries, 1972, B. Sawdon, 1987. J. Imray (com.), 2035. J. Hickisson, 2112. F. J. Duggan, 2135. W. F. D. Miller, 2158. J. and T. Archer, 2221.

Lead (salts and oxides).—H. H. Lake (com.), 2278. J. Huiks, 2265. J. Mitchell, 2302.

Leather, Treating Hides and Skins, Parchment, Currying, Tanning, Cutting, and Ornamenting Leather.—D. Gardner (com.), 2029. J. J. I. and B. Stecks, 2198. A. M. Clark (com.), 2218. W. E. Gedge (com.,), 2378.

Life-buoys, &c.—A. Young, 1933. P. P. de la Sala, 2000. A. M. Clark (com.), 2234. J. W. Watts, 2285.

Locks, Latches, Bolts, Lock Furniture, Keys. &c.—A. M. Clarke (com.), 2032. P. M. Justice (com.), 2053. J. M. Hart, 2124. M. Gilmour, 2240. T. H. P. Dennis, 2327.

Looking Glasses, Mirrors.—H. Carter, 2210. T. Read, 1903. J. H. Shipway, 2056. H. J. Haddan (com.), 2222. A. E. Robinson.

Mathematical, Surveying, and Astronomical Instruments.—H. H. Lake (com.), 2064.

Medicines, &c.—J. H. Clark, 2205.

Metals (Coating, Plating, &c.)—H. F. Taylor and C. Leyshon, 2106. T. Bowen and E. Jenkins, 2289. A. Shippey and R. Punshon, 2293.

Metals (Cutting, &c.)—C. D. Abel (com.), 1991, H. J. Haddan (com.), 2018. J. Westwood and R. Baillie, 2100. G. Richards (com.), 2260.

Metals (Forging), &c.—G. W. Knox, 1917. W. Randle, 1929. R. Yates, 1931. H. H. Andrews, 1995. T. Cuttriss (com.), 2135. W. H. Beck (com.), 2261. J. Farmer, 2316.

Metals (Smelting, &c.)—A. M. Clark (com.), 1913. S. G. Thomas, 1949. H. J. Haddan (com.), 2070. T. Lishman, 2082. T. N. Miller, 2219. H. H. Lake (com.), 2278. E. A. Cowper, 2381.

Meters, Measuring Liguids and Fluids, &c.—W. Parkinson, 2134. E. G. Rivers, 2146.

Mining, Boring and Blasting Rock, Raising from Mines, Getting Coals, Draining, Lighting, and Ventilating Mines.—J. McCulloch, and W. Cook, 1936. T. Sheehan, 2407.

Mixing, Kneading, Mashing, Stirring, Agitating, &c.—J. Forbes and J. Hamilton, 2012. J. Goodwin, 2117.

Motive-power Machines, Obtaining Motive power.—A. W. Cooper, 1983. E. H. Greeven (com.), 1988. E A Brydges (com.), 2050. H. F. Maitland, 2093. T. Charlton and J. Wright, 2166. W. P. Thompson (com.), 2167. G. C. Peck, 2284. W. Anyon and J. Lund, 2291. H. J. Haddan (com.), 2309. J. Emery, 2356.

Music, &c.—R. Bishop and W. Down, 2127. E. M. Eassor, 2141. A. Wilkinson, 2159..

Nuts and Washers.—J. T. King, 1970.

Oiling or Lubricating, &c.—A. Montgomerie, 2154.

Oils, Fatty Matters, Grease.—E. de Pass (com.), 1928. J. Robinson, 1998. E. W. Bell, 2077. J. Longmore, 2297.

Ornamenting, &c.—J. Muguier, 1927. C. J. Bishop, 2025. S. J. Kelly and C. Lindsay, 2209. C. Johnson, 2211. A. H. Horsfall, 2220.

Ovens and Kilns.—G. Brogden and E. Casper, 2170.

Oxidation, (Preventing) &c.—D. Johnston, 2011.

Packing Goods, &c.—A, W. L. Reddie (com.), 2176.

Paints, Colours, Varnishes, &c.—J. Gray, 2157. S. J. Kelly and C. B. Lindsay, 2209.

Paper Pasteboard, Papier Mache, Paper Hangings.—G. Tidcombe, 1908. D. Smith and C. Robertson, 2143. A. M. Clark, (com.), 2303.

Pens, Penholders, Pencils, Pencil Cases, &c.—J. Spear (com.), 1923. C. D. Abel (com.), 1937. M. Fischer, 2039. G. Daubenspeck, 2131. W. Sinclair, 2153.

Photography and Photographic Apparatus.—F. Wirth (com,), 2156.

Photometers.—C. W. Morley, 1886.

Pictures, Portraits, &c.—H. J. Haddan (com.), 2257. J. Mitchell, 2302.

Pins.—G. F. Redfern (com.), 2140.

Pipes, Tubes, and Syphons: Joining Pipes.—C. D. Abel (com.), 1991. C. Hett, 2155. W. T. Whiteman (com.), 2300. J. Farmer, 2316. W. E. Everett, 2341. T. Daltry, 2345.

Preserving Food, &c.—W. A. Barlow (com.), 2322.

Preserving Miscellaneous Substances.—W. E. Gedge (com.), 2578.

Presses, Compressing, &c.—E. Belviews, 1965.

Printing and Transferring: Type and other Surfaces for Printing, Composing, and Distributing Type.—A. M. Clark 1981. F. Wirth (com.), 2156. W. R. Lake (com.), 2203.

Propelling Carriages &c.—W. P. Thompson 1924.

Propelling Machinery, Transmitting Power and Motion, Converting Movements.—H. Maitland, 2093. C. Truman, 2326.

Propelling Ships, Propellers, Paddle-wheel, and Screws.—T. Lambert, 1899. D. Johnston, 2011. A. J. Davison, 2085.

Pulleys.—G. Golland. 2031. W. R. Lake (com.), 2246. A. W. L. Reddie (com.), 2317.

Pumps, Pumping and Forcing Liquids, Pumping and Raising Water and other Liquids, Pumps, Pistons, and Packing.—E. Greeven (com.), 1988. J. Forbes, 2012. J. Harrop, 2034. C. Woodward, 236ü.

Punching, or Perforating, &c.—J. Day, 2279.

Purses, &c.—F. Wirth (com.), 2389.

Rugs, &c.—E. Mansfield, 2021. T. R. and T. W. Harding, 2252.

Railways, Carriages, Coupling, Uncoupling, and Altering Positions of Carriage and Engines.—P. M. Justice (com.), 2053. J. Tuiton and J. Brunlees, 2078. J. N. Hart, 2124. H. J. Haddan (com.), 2223.

Railway, Permanent Way, Rail Joints, Chairs and Sleepers, Portable Railways, Atmospheric Railways, Switches, Points, Crossings, and Turn-tables.—W. P. Thompson (com.), 1924.

Refrigerating and Freezing, Cooling Liquids Making Ices, &c.—J. Chambers, 1984. W. R. Lake (com.), 2026. E. G. Rivers, 2146. W. P. Thompson (com.), 2171. A. Allworth, 2228. W. A. Barlow (com.), 2323. G. C. Lilley, 2180. A. Smith and S. A. Taylor, 2195. J. Morris, 2305.

Roads, Paths, &c.—T. Riggs, 1916.

Rods and Bars.—J. Greenwood, 2218.

Ropes, &c.—E. Mansfield, 2021.

Safes, &c.—S. Wilkins, 2066,

Screens.—J. Mitchell, 2302.

Screws, Screw Drivers, &c.—T. J. and J Adams, 2392.

Sewing and Embroidering.—H. Simon (com.), 1906. T. and E. Stanton, 2262. W. R. Lake (com.), 2298. A. Fisher, 2399.

Shelves, &c.—C. J. Appleton and S. H. Ogden, 1971.

Ships and Boats, &c.—W. L. Wise (com.), 1944. A. Wilson, 2130. J. T. Grindrod (com.,), 2333.

Sifting, Sorting, and Separating, &c.—C. D. Abel (com.), 2007. C. B. Wellin, 2045. H. J. Haddan (com.), 2070. J. Beal, 2149.

Signals, &c.—J, W. Kenyon, 1985. E. J. Chabrel, 2009. T, Whittingham, 2027. A. Wharton, 2160. J. R. Brown, 2649. P. Jensen (com.), 2107. W. Goallu, 2190. A. Smythe and L. A. Taylor, 2195. A. W. Tuer and J. Cleminson, 2200. J. Maclaren and H. M. Skerrell 2247. W. E. Longdon, 2384.

Sounds, (Reproducing) &c.—J. H. Johnson (com.), 2065. J. W. Johnson (com.), 2237. W. C. Barney, 2259.

Spindles and Flyers.—E. Britton, 2137.

Spinning and Preparing for Spinning.—J. W. R. Lake (com.), 1978. J. W. Harding, 2040. H. H. Lake (com.), 2579. H. Hill, 2253. T. O. Glaser (com.), 2287. F. J. Smith, 2328. L. A. Groth (com.), 2386.

Sponge,—H. J. Haddan (com.), 2087.

Spray Producers.—L. H. Armour, 1948. C. B. Wellin, 2042.

Springs.—W. Buckley, 1912.

Starch, &c.—J. T. Armstrong, 2014.

Steam and other Boilers, Cleaning and Preventing Incrustation of Boilers, Water Feeding Apparatus for Boilers.—G. W. Hawksley and M. Wild, 1958. E. Edwards (com.), 1968. W. and G. Beasley, 2074. I. J. Thornycroft, 2102. A. F. Yarrow, 2111. A, J. Boult (com.), 2118. F. H. F. Engel (com.), 2324.

Steam Engines (Stationary, Locomotive, and Marine.)—J. H. Johnson (com.), 2091. J. Hopwood, 2096. T. Perkins, 2230. G. Robson, 2322.

Stone, &c.—R. Guelton, 2097.

Straps.—B. Marsden, 2358.

Sugar and Syrups, Glucose.—W. R. Lake (com.), 2028. A. and J. D. Scott and T. R. Ogilvie, 2161. C. Scheibler, 2239. T. Webb, 2372.

Surgery, &c.—H. Hides, 1963. E. de Pass (com.), 2048. T. and W. J. Nicholls, 2073.

Tarpaulins, &c.—E. Mansfield, 2021.

Teaching.—E. M. Easson, 2141.

Telegraphs; Telegraph Printing Apparatus.—W. M. Brown (com.), 1945. W. Chadburn, 1994. J. H. Johnson, (com.), 2065, W. C. Barney, 2259. A. Shippey and R. Punshon, 2293. Sir J. Anderson and W. C. Johnson, 2311.

Testing Strength, &c.—W. Porter, 2080.

Threads and Yarns.—F. Wirth (com.), 2283.

Tickets, Labels, &c.—C. Keith, 2083.

Tilling and Cultivating, &c.—T. Reid, 1903. R. P. Yates, 1931. E. Button, 2137. C. A. Snow (com.), 2142. T. Perkins, 2230. R. J. and H. Wilden, 2269.

Tobacco and Snuff, Cigars, Cigar-Holders, Pipe and Cigar-lighters, Smoking Pipes, Tobacco Pouches, &c.—C. J. Appleton and S. H. Ogden. 1971. W. J. Walden, 2016. B. L. James, 2147. J. Stanley, 2363.

Tombstones.—H. J. Haddan (com.), 1953.

Tools, &c.—M. Merichenski, 2033.

Tramway Carriages, &c.—W. P. Thompson (com.), 1924.

Tramways, &c.—F. C. Glaser (com.), 2334.

Traps for Drains, &c.—J. N. Hale, 2272.

Trimmings, &c.—A. H. Horsfall, 2220.

Tunnels, &c.—F. R. Crampton, 2002.

Umbrellas, Parasols, &c.—F. Wolff, 1955. J. T. and S. Lilly, 1993.

UPHOLSTERY, &c.—J. Watts, 2285. S. Isaacs, 2331.

URINALS, &c.—J. Beresford, 1979. W. McGill, 2120.

VALVES, Taps, Stop Cocks, Plugs; Regulating the Flow and Pressure of Fluids.—E. Sutcliffe, 1943. J. Baldwin, 1977. J. Shipway, 2056. A. Sweet, 2150. T. C. Summers, 2216. J. C. Mewburn (com.), 2383.

VELOCIPEDES.—J. S. Harrison, 1911. H. Whitehouse, 2113. H. Bennett, 2139. W. Dawes and J. Tankard, 2148. H. F. D. Miller, 2158. J. Harrington, 2172. C. Harvey and W. Paddock, 2174. H. T. Davey and P. A. Hobst, 2268. J. and H. J. Brookes and M. Green, 2282. C. Truman, 2326. G. D. Macdougald, 2361. L. H. Court is, 2371. A. Phillips, 2380.

VENTILATION, &c.—T. E. Bladon, 1975. M. Willshaw, 2006. A. W. Kershaw, 2116. T. W. Hellwill, 2121. C. H. von Ullner, 2273.

WALKING STICKS, &c.—W. Beck (com.) 2261.

WASHING, &c.—J. Mitchell, 2013. J. Body, 2036. T. J. Millings and W. Whiteley, 2051.

WATER-CLOSETS, &c.—F. Vermann (com.), 2307.

WATER-POWER Engines, &c.—H. J. Haddan (com.), 1990. J. Hopwood, 2096. C. Megor and J. L. Markel, 2108.

WEAVING, Braiding, Plaiting, Preparing for Weaving, &c.—H. W. and H. King, 1996. I. Hamilton, 2038. W. R. Lake (com.), 2042. J. Aspinall, 2069. I. Brownlee, 2090. T. Anderson, 2254. E. Briggs, 2292.

WHEELS for Carriages, &c.—G. W. Knox, 1917. N. J. Crow, 2089. R. Hadfield, 2101. T. Cooke, 2114.

WHEELS for Machinery, &c.—H. J. Haddan (com.), 2018. A. W. L. Reddie (com.), 2317.

WINDING Thread, &c.—H. C. Hill and H. Brown, 2196. B. M. Knox, 2290.

WINDOWS, &c.—G. Hurdle and W. Davie, 2015. D. Walker and W. S. Simpson, 2084. A. Foster, 2179. I. Michell, 2302.

WINE, &c.—J. Prosser, 2376.

WIRE, Wire Working, &c.—A. W. L. Reddie (com.), 2176. A. Arnold, 2212. T. Bowen and E. Jenkins, 2289. A. Shipway and R. Punshon, 2293. E. S. Rock (com.), 2319.

⁂ *The above List is prepared from the Patent Records by Mr. T. Morgan, Secretary of the Inventors' Patentright Association, Limited.*

THE KYROGRAPH.—It appears that however "steady-handed" we may think ourselves, not one of us is really able to maintain the hand perfectly motionless for any length of time; there are a series of movements constantly taking place, which, however slight and unnoticeable they may be, are yet sufficiently powerful to overcome all the muscular resistance we may use against them. Dr. Percy R. Wilde gives an account in the *Edinburgh Medical Journal* of the instrument he has been using in his successful attempt at their analysis. The person places the hand on a floating platform, and every movement communicated to it by the hand is registered on a prepared tablet in a magnified form. Not only does it transcribe the minutest movement, but it further indicates its cause. If a person laughs, yawns, or moves it is at once recorded on the tablet. If he tries to prevent the movements, or increase them, the operator can tell, by examining the tracing, what has taken place. If he is momentarily startled and shows it by no other sign, there is always a particular movement of the hand, causing a certain loop-like figure to appear on the tablet, which to those learned in kyrography is unmistakable. But the most curious part of this investigation is the discovery that both hands have an involuntary tendency to move towards the left side, a movement which we counteract without knowing it by another movement towards the right. This Dr. Wilde calls the reflex muscular movement. The kyrographic tracings plainly demonstrate that this motion is most developed in those whose occupations require great steadiness of hand. Dr. Percy E. Wilde states that the study of the causes which lead to these results have brought him in contact with some very interesting facts, which he will shortly record.—*Daily Times and Mirror (Bristol.)*

Reviews.

HOT-WATER HEATING.

"Hot-Water Heating on the Low-Pressure System." Comprising some of the Principles Involved, an Explanation of the Apparatus and its Parts; also its Application to Buildings of Various Descriptions. By F. A. FAWKES, F.R.H.S., Author of "Horticultural Buildings." 32 Illustrations. B. T. Batsford, 52, High Holborn. *Journal of Horticulture*, 171, Fleet Street, London.

THE author of this work states that during several years past he has received, in his capacity as a Hot-water Engineer, a great many applications from country gentlemen, clergymen, churchwardens, architects, engineers, gardeners, and others, for information relating to hot-water heating and its application to various buildings with which they were connected. Not being able to indicate to them any existing treatise which would exactly meet their requirements, he has been impelled to embody in a concise form, at a price attainable by every class of the community, the notes collected on the subject.

This small treatise must, however, be regarded as indicative and suggestive rather than exhaustive.

A general description of the apparatus is first given, then a brief description of all the parts. (A great portion of this has been extracted, revised, and modified from the section on heating in the recently published work, "Horticultural Buildings.") Then the chief characteristics of some of the other principal systems of heating are referred to for the purpose of comparing each with Hot-water Heating. Then a few of the leading points of general ventilation are given, and special notes on the application of Low Pressure Hot-water Heating to churches, chapels, public buildings, large establishments, dwelling-houses, conservatories, greenhouses, forcing-houses, &c., are appended. A list of the chief causes of failure of the system, a few legal notes, and an index, complete the volume.

Although this is one of those works now so common whereby a professional man seeks to bring his qualifications before the public, yet we can truly say that its pages are well worthy the perusal of all interested in the subject referred to by its title.

THE MARINE SURVEY OF INDIA.

"General Report on the Operations of the Marine Survey of India, for the Year 1880-81." Prepared for Submission to the Government of India by Commander A. DUNDAS TAYLOR (late I. N.), F.R.G.S., Superintendent of Marine Surveys. Calcutta: Office of the Superintendent of Government Printing.

THIS report is worthy of the Indian Government Department from which it emanates. It is too detailed and voluminous to allow us to give anything beyond a general notion of its contents, namely:—Surveying Operations of the Season; Instructions to the Officers in charge of the Survey Parties; New Surveying Steamer "Investigator;" Work Executed at Head-quarters; Subjects Referred to the Department for Report; Appointment of a Light-house Committee; Hydrographic Notices and Notices to Mariners Published; List of Light-houses and Light-vessels in British India; Wreck Return; Number of Publications Issued by the Department since the date on which work was commenced at Head-quarters; Charts Issued for Official Use, or Sold, and Sale Proceeds Thereof; Official Changes and Good Services of the Officers of the Department; Establishment of Department. As regards Chart Branch:—Amount of Work Executed in the Branch; Number of Charts Published during the Year; Number of Charts Corrected during the Year; Number of British and Foreign Hydrographic Notices and Notices to Mariners Examined; Tabular Statements Showing in Detail the Amount of Work Performed in this Branch from the 1st October, 1880, to the 30th December, 1881, inclusive. Surveying operations embrace Survey of Bombay Harbour; Survey of Goa and Mormugao; Survey of the Port of Rangoon; Survey of False Point; Total Outturn of Work by Officers of the Department for year 1880-81. Appendices refer to Extract from the Narrative Report, dated 15th August, 1881, by Navigating Lieutenant E. W. Petley, R.N., F.R.G.S., Assistant Superintendent of Marine Surveys, in charge of Goa Survey; Notes on Rangoon, compiled from Various Authorities by Lieutenant W. H. Coombs, R.N., Assistant Superintendent of Marine Surveys, in charge of the Rangoon Survey; Report on the Set and Velocity of Tides at False Point Harbour, during the months of August and September, 1881, by Mr. P. J. Falle, Assistant Superintendent of Marine Surveys; List of Charts, &c., issued at the Marine Survey Department from April, 1875, the date on which Work was Commenced at Head-quarters, to 30th September, 1881, inclusive; Statement Showing the Cost of the Marine Survey Department from 1st October, 1880, to 30th September, 1881.

LITERARY ANNOUNCEMENTS.—The Scientific Publishing Company, 22, Buckingham Street, London, W.C., announce that they have in the press "Photometry and Gas Analysis, by J. T. Brown, F.C.S., divided into three sections—"Standards," in two chapters, "Photometers," in eight chapters, and "Gas Analysis," in two chapters. The book will be found useful to scientists, chemists, analysts, engineers, students, &c. The Company also announce the publishing in handy form of the "Minutes of Evidence on Electric Lighting Bill, 1882," with text of the Bill and a commentary on the whole. This will form a most useful work, and will be found of considerable service to those interested in lighting.

SONNET
IN MEMORY OF
HENRY WADSWORTH LONGFELLOW.

Poet and singer of the sacred muse,
Who, in the fields of fancy, ever sped,
And o'er thy life a living aura shed!
Fain would my soul its holiest influence use,
And thro' the world thy classic song diffuse,
Thy "PSALM OF LIFE" is o'er, but never dead
Will be the laurels circling round thy head,
Nor thy bright name its lustre ever lose.

Thy life a noble purpose! full and free;
Laden with love in sympathy with men.
The "FOOTSTEPS OF THE ANGELS" came near thee,
And thus inspired, with voice divine, thy pen.
"EXCELSIOR" thyself! on spirit-wing
Now hearest thou the angel-seraphs sing.

HENRY GEORGE HELLON.

Heating and ventilating buildings, patented by Mr. Lyman A. Spaulding, of Port Huron, Mich, is to obtain thorough and uniform ventilation of large rooms—such as public halls, school rooms, churches, and railroad cars—and as a consequence a uniform distribution of the heated air from the registers or other sources of supply. The inventor uses floor registers connecting by passages with a ventilating shaft, the passages being so arranged that they are of uniform length between the shaft and registers wherever the registers be placed, so that instead of the exit of air being entirely at the registers nearest to the shaft, there will be a uniform action at every register.

Correspondence.

THE UTILISATION FOR THE PUBLIC GOOD OF THE RAILWAY STATION AND ITS CONTIGUOUS PROPERTY BOTH ECONOMICALLY AND SOCIALLY IN EVERY CITY, TOWN, AND VILLAGE OF THE UNITED KINGDOM.

TO THE EDITOR OF THE SCIENTIFIC REVIEW.

SIR,—The time has arrived when the public and railway companies should cease to regard the railway stations simply and only a locality for the arrival and the departure of passengers and luggage. The economic and social utilisation of the railway station, guided by railway intelligence, enterprise, and capital, indicates a most important epoch in our national railway progress, whilst it deservedly reveals numerous fresh and lucrative sources of permanent yearly revenue to railway companies. The comfort, convenience, and social well-being of all the inhabitants of our cities and towns will be enormously promoted and increased. Another most important epoch in railway progress is imperatively at hand, which will enable railway companies not only to direct traffic as now, but in numerous localities actually to command it. Railway companies, guided by railway intelligence, enterprise, and capital, must erect for the multitudes their home dwellings of the future wherever needed and in close proximity to railway stations, both for the married and especially for the single, and built accordingly of Crystal Palace or Peabody magnitude, accommodating from one to five thousand families or more under one roof. Such as Harvey's Home Dwellings of Associated Homes, and similarly to Harvey's Associated Lodging-houses. The vast rentals of residents and tenants and their yearly traffic to and fro must enormously add to the permanent yearly revenue of railway companies. These colossal home dwellings are the only perfect realisations of practical Christianity and co-operative economy, and are most urgently needed for all the separate classes of society in all the numerous outskirts (and elsewhere) surrounding London and all cities and towns in the United Kingdom. Every village railway station, including Harvey's village aqueductal passenger railway station, besides the village railway station co-operative stores urgently needed in every village, the village railway station reading-room or club for men and boys, and a similar one for women and girls. And here I would direct the attention of railway companies to Harvey's well-known invention of the People's Geographical Garden, or Cosmos, which when known and understood like the Crystal Palace would prove a lucrative source of yearly revenue to any railway company. Railway stations in London and in all our cities and towns should contain Harvey's most appropriate, useful, and inexpensive scheme of the Railway Station Registration Residence and Address, Search Office, and similarly Harvey's Provincial Safe Deposit Institution for the safe custody of securities and valuables, &c., of citizens and townspeople. The Railway Station Lost Property Office for the city or town; the Railway Station Repository for the safe storage of bulky property and for furniture; the Railway Station Lecture Hall for hire. The following railway station reading-rooms or clubs:—The Ladies', the Working Womens', the Domestic Servants', the Boys' and the Girls'; the Railway Station Reading-room or Club for gentlemen, and a similar one for working men; and if a seaport town, one for sailors and fishermen. Lastly, the Railway Station Co-operative Stores, most urgently needed in every city and town in the United Kingdom —I am, &c.,

AUGUSTUS J. HARVEY.

6, Cromwell Terrace, Southtown,
Great Yarmouth, 19th May, 1882.

HUGHES'S MAGIC LANTERN LAMP.

The recent meeting of the Inventors' Institute, when Mr. W. C. Hughes attended and explained his Pamphengos Lamp, was illustrated in a very interesting manner by using same in magic lantern, the nature of which will be understood by the following statement of the Chairman, Mr. F. H. Varley, E.C.:—

The Chairman, after some remarks respecting the advantage that flat wick paraffin lamps possessed over the argand or cylindrical flame, then remarked that the interest which the Inventors' Institute took in the labours of such gentlemen as Mr. Hughes arose from the lantern trade being an important branch of industry, there being little doubt that the impetus given to the trade was attributable to the introduction of the paraffin lamp flame, which allowed of the greatest amount of concentration of light in the focus of the condensing lens and the placing of the body of the flame in the optic axis or axis of illumination. The concentration of light in the optic axis is the great point to be achieved. Mr. Hughes, on a former occasion, showed us the great power of illumination he had obtained with his three-wick lamp. On this occasion he succeeds in getting a perfect combustion with four wicks, and a proportionate increase of the illuminating effect is the result. Those who have experimented with triplex or quadruplex lamps know the difficulty in obtaining a perfect and steady combustion, and therefore must appreciate the labours of Mr. Hughes in so successfully solving the problem. There are points in the invention before us, such as the chimney or combustion chamber, which merit our consideration. In the ordinary lanterns the lamp glasses crack; this Mr. Hughes overcomes by a contrivance as simple as it is efficient. If we think for a moment why the ordinary chimney or lamp glass cracks, the reason becomes obvious; those portions of glass nearest to the flame are heated to the greatest degree, whilst the more remote part is necessarily cooler. You then have a cylinder of glass unequally heated, and, therefore, unequally expanded. It is this stress or strain from the unequal expansion which causes the glass to crack. Mr. Hughes employs segments of a cylinder which fit against the metal sides of the chimney; the glass thus being more uniformly heated is less subject to the undue strain of unequal expansion, and the result obtained is the concentration of light in a perfect combustion chamber without the inconvenience or risk of breaking the lamp glasses. The whole construction of the lantern and lamp shows a great attention and care, and reflects credit upon the persevering labours of Mr. Hughes, and I have therefore much pleasure in proposing a vote of thanks to that gentleman.

This was seconded by Mr. Morgan and carried by acclamation.

The vote of thanks to the Chairman was moved by Mr. J. P. Cutts, seconded by Mr. Kenny, and carried unanimously.

ROLLER-MILLS AND MILLING AS PRACTISED AT BUDAPEST.

THE following Paper on this subject was read before the Institution of Civil Engineers, on the 16th May, by Mr. W. B. HARDING.

In the early years of the present century it had been recognised that, in order to obtain pure wheaten flour free from particles of bran, the old custom of grinding between stones must be superseded, at least as regards its constituting a complete process. The outcome of various experiments was the roller-mill, probably first brought into practical shape and used in Switzerland about the year 1820. In 1839 was established, from the designs of Mr. Fehr, a Swiss engineer, the "Josef Walzmühle," the first in Hungary to adopt the new system. The installation comprised thirty-six roller-mills, with which it was originally proposed to accomplish the whole work of grinding, but consequently eight pairs of stones were added to effect the finer reductions. This mill afterwards passed into the hands of a company, and became known as the "Pester Walzmühle," and its powers of production were increased by the addition of sixty-four roller-mills, besides several pairs of stones. During the last thirty years, thirteen other large mills on the same principle had been erected in Budapest; and the result of nearly fifty years' experience was to define clearly the functions and position of the roller-mill as the agent must suited for the preliminary process of granulating, requisite in the production of high-grade flour. For the subsequent reduction of the middlings produced by the rollers, nothing had been found superior to the old-fashioned stones; a modern first-class mill in Hungary, therefore, contained each class of machine as the necessary complement of the other.

The system of milling adopted in Budapest had for its object to obtain, from a given quanty of grain, the largest amount of fine white flour, and the commercial success which had attended the costly and laborious efforts in this direction, might be taken as a proof that the end justified the means. As a broad principle, the manipulations required in high grinding remained the same under all circumstances, although local conditions and the nature of the wheat might vary the details of the operation. The process necessitated five or six times "shroten" (*i.e.*, bruising or granulating) between fluted rollers, and the passing of the produce from each break through a system of sorting and dressing machines. Further, from twice to four times "auflösing" (*i.e.*, separating small portions of bran adhering to the fine middlings) between rollers either quite smooth or very finely fluted, the produce being carefully sorted and dressed as before after each operation. Lastly, the passing of the purified middlings and meal between stones, and the final dressing. The whole manipulation was arranged so as to require a minimum of manual labour, and the transport of the various products in the required direction was arranged automatically.

The period of procedure in a large mill was described in detail, from the time the wheat, thoroughly cleansed, was delivered to the first roller mill, to the sacking of the refined flour, by which time it had undergone eighteen distinct operations, performed at different stages of a continuous journey through the mill, besides being concerned in various subsidiary processes affecting the treatment of the by-products.

A *combined button-lap and stay* for garments has been patented by Mr. David W. Thompson, of Englewood, Ill. This invention relates to an improved combined button-lap and stay for the openings in garments—such as the opening at the neck of a shirt, the opening in the front or sides of drawers, overalls, &c.; and it consists in the combination, with the garment or body piece having simply a straight slit cut in it where the opening is to be, of a single piece of material, which, when folded and stitched to the sides of the slit, constitutes both an upper and under button-lap or fly, a facing, and a stay for re-enforcing the bottom of the opening, making a finished piece of work without raw edges.

A mechanical musical instrument has been patented by Mr. Henry Wegman, of Ithaca, N. Y. This invention relates to musical instruments in which strips of perforated material are used for governing the admission of air to the reeds and pipes; and it consists in the novel construction by means of which the reeds and pipes can be operated singly and in combination with the same perforated paper.

INVENTORS' INSTITUTE.

The 20th annual general meeting of the Institute was held on the 25th May, 1882, at 4, St. Martin's Place, Trafalgar Square. Amongst the members present were Messrs. J. P. Cutts, F. H. Varley, J. Kenny, T. Morgan, and F. W. Campin (Secretary). Mr. G. A. Stretton (Receiver and Acting Treasurer) also attended the meeting. F. H. Varley, Esq., was voted to the chair, and took same accordingly. The minutes of the last annual general meeting were read and confirmed as being correctly entered. The Secretary then presented the annual report, which was as follows:—

Twentieth Annual Report of the Executive Council of the Inventors' Institute (*Session*, 1881-82).

During the past year the Institute has sustained a serious loss by the sudden death of its President (Sir Antonio Brady), who has for years past been its earnest advocate and promoter. He was a continuous and active worker, possessing a position which enabled him to take the actual utilisation of the functions of President into his own hands, and he really and truly made same a portion of his life work. Memoirs of his life and labours have already been placed before the public in the journal of the Institute (SCIENTIFIC REVIEW) and a vote of condolence with Lady Brady and family has been passed by the members of the Inventors' Institute, but the Council deems it a duty to ask the whole body to place on record by vote at its Annual General Meeting its high appreciation and value of the work and worth of Sir Antonio Brady, who has so ably presided over the Institute for more than ten years past. His lamented death necessarily left the office of President vacant, and as this occurred at a time when Parliament was in full work it was deemed desirable to secure a suitable President without delay, and after much consideration it was settled that one of the senior Vice-Presidents of the Institute should be solicited to become President, and by the aid and solicitation of Admiral J. H. Selwyn, Vice-President, His Grace the Duke of Manchester was induced to take the Presidentship.

In this report the Executive Council is still under the necessity of bringing before the members the question of amendment of the Patent Laws. Mr. Anderson, M.P. for Glasgow, has again presented a Bill of Amendment which has had little change bestowed on it since its first introduction to Parliament; indeed the only change is one that is disadvantageous—the increase of the initial fee from 10s. to £1 10s.,—in other respects the Bill is very similar to Mr. Anderson's former Bills. It provides, as heretofore, for enlarging the term of Patents to 21 years, the appointment of permanent Commissioners, and the reduction of cost to a considerable extent, that is to say:—the existing stamp duties are replaced by the following:— stamp on petition, £1 10s.; notice to proceed, £1; sealing, £1; specification, £1. Independently of this Bill the Society of Arts have assumed the preparation and publication of a Patent Bill, which has been read a second time in the House of Commons, and is understood to be acknowledged by the Government as being so far worthy of consideration as to be considered along with a Government Bill, which in accordance with the promise made in Her Majesty's speech in opening the present Session of Parliament, Mr. Chamberlain, President of the Board of Trade, has yet to bring into the House of Commons. The main points of the Society of Arts Bill appeared in the SCIENTIFIC REVIEW for May.

Several of the meetings of the Institute during the past session have been occupied by discussion on the subject of Patent Law Reform, and a paper on suggested amendments has been read by Mr. T. Morgan.

Other subjects of general interest have been brought forward at the remaining meetings, and amongst important Inventions exhibited and explained may be noticed Dr. Croft's screw paddle propellers, and Mr. Hughes' recent improvements in lamps for magic lanterns and similar purposes; also Mr. D. M. Reid's improved locomotive arrangements, on which a paper was given by Mr. T. Morgan.

To the gentlemen above named, as to others who have contributed papers during the session, the Council have to propose that the thanks of this annual meeting of the Institute be given.

With regard to the Finances, the Executive council have to submit the usual balance sheet, which has been prepared by the acting Treasurer and duly audited by Mr. J. P. Cutts, auditor of the Institute.

During several years, various propositions have been made as to the increase of the *General* Council by placing thereon members of the Institute who may be deemed worthy of that position. This matter is left open for the consideration of the meeting, with this explanation,—that under the Rules at present in operation, a member of the General Council is placed in a prominent position, but is not called upon, nor is he authorised, to take in hand the management of the Institute, which is the province of the Executive Council. Names proposed for the General Council are submitted to the meeting. As regards the Executive Council, by death we have lost Mr. A. J. Murray, and from general ill-health Mr. S. Calley has long ceased to be an attendant at the Executive Council Meetings, but it is hoped that Mr. Calley may take his place at the board at a future day, though the Executive Council would ask to be allowed to fill up the vacancy in his case if circumstances render it necessary. In the place of Mr. Murray, Mr. J. Kenny, who has been doing much active work for the Institute with regard to the Patent Laws, should be elected on the Executive Council. According to the Rules one third of the Executive Council retire by rotation. These are F. H. Varley, Esq., C.E., &c.; W. H. Barlow, Esq., F.R.S.; and T. Paterson, Esq. It is thought desirable that the Executive Council be empowered to add to the list of members of the Institute according as the nature of circumstances may permit.

This report was received and adopted.

The Balance sheets (Nos. 1 and 2) were presented and accepted.

It was resolved, on the motion of the chairman, seconded by Mr. Kenny, that the Report and Balance sheets be adopted.

It was resolved, on the motion of the chairman, seconded by T. Morgan, Esq., that the Executive Council be authorised to place the names of any suitable members of the Institute on the list of the General Council; also to elect members to fill any vacancy in the Executive Council. It was proposed by the chairman, and seconded by J. P. Cutts, Esq., that the Secretary be directed and empowered to take action in regard to the question of Patent Law Amendment as now before the House of Commons, that same may be speedily and effectually settled, and that witnesses to represent the views of the Institute be heard and taken into consideration before passing any Act of Parliament on Patent Law.

It was resolved that certain accounts be liquidated by the Secretary and Acting Treasurer, and that the Printing accounts be left to them as directed.

It was resolved on the motion of J. P. Cutts, Esq., seconded by F. W. Campin, Esq., that F. H. Varley, Esq., be elected Chairman of the Executive Council, to preside over the meetings thereof in the absence of the President or Vice-President.

Elections were then proceeded with, and resulted as follows:—

His Grace the Duke of Manchester as President.

The Vice-Presidents and General Council as per former list.

Messrs. F. H. Varley, C.E., W. H. Barlow, F.R.S., and Dr. J. McGrigor Croft (the members retiring from Executive Council in accordance with the Rules) were re-elected, and Mr. J. Kenny was elected in place of A. J. Murray, Esq., deceased.

Mr. F. W. Campin was re-elected to the office of Secretary, and Mr. John P. Cutts Honorary Auditor.

The usual votes of thanks to the President, Vice-Presidents, Council, and Officers terminated the proceedings.

THE MIDLAND ELECTRIC LIGHT AND POWER COMPANY *VERSUS* THE BRUSH MIDLAND ELECTRIC LIGHT AND POWER COMPANY.

THIS was a motion to restrain the defendants from using the style or name of the Brush Midland Electric Light and Power Company (Limited), or any other name so identical with the plaintiffs' style or name as to be calculated to deceive or mislead. The plaintiff company was registered in December, 1881, and shortly afterwards the defendants applied for registration under a similar name: but the Registrar of Joint Stock Companies pointed out the prior registration of the plaintiffs' company, and the defendants thereupon prefixed the name "Brush" to their title, and proceeded to register such new name. The plaintiffs admitted that the defendants had no intention to commit any fraud, but they contended that the two names were so identical as to deceive, and that the word "Midland" was the main word in both names.

Mr. W. Barber, Q.C., and Mr. Hoare Colt appeared for the plaintiffs; Mr. Ince, Q.C., and Mr. Northmore Lawrence for the defendants.

Mr. Justice Chitty was of opinion, as there was no question of fraud in the case, that the two names themselves were not sufficiently similar to deceive. The term "Brush" was to his mind the main and leading feature in the defendants' name, and there was nothing to mislead any person in possession of his senses. He should, therefore, dismiss the motion, and as the plaintiffs did not desire to carry the case further, the action would also be dismissed with costs.

FAURE ELECTRIC ACCUMULATOR POWER BY TRAIN MOTION.—Professor Ayrton, at the meeting of this accumulator company on 27th May, in answer to questions, stated that the delay in completing the work offered to them had been on account of the unwillingness of the directors to enter into contracts before they were quite sure of getting the things they contracted to sell. In addition to what the chairman had stated, experiments had been carried out on the Brighton and Kemp-town train, in which case no stationary engine was employed, as in the case of the Pullman train to Brighton. In the Kemp-town train the electricity was produced directly by the motion of the train turning a dynamo electricity machine in the guard's van, and the surplus of the electricity which was not required to produce the light was stored up in Faure's accumulator in the train. When the train was going slowly or was at rest the lamps in all the carriages were simply kept alight by the stored-up electric power. This experiment has been so successful that the engineer of the Brighton Company was now making arrangements to continue it on a much larger scale. The chairman added that they had made arrangements to light the Pullman train to Bradford which was going to take the Prince of Wales down on the 2nd of June, and if that were done successfully there was, he said, reason to believe that the Midland Company would adopt their light.

The Scientific Review

AND

SCIENTIFIC AND LITERARY REVIEW,

A RECORD OF PROGRESS IN
ARTS, INDUSTRY, AND MANUFACTURES,
INCORPORATING THE
JOURNAL OF THE INVENTORS' INSTITUTE,
(*Established* 1865.)

Is published in the first week of every month at the
OFFICES, 21, COCKSPUR STREET, CHARING CROSS,
LONDON, S.W.

The SCIENTIFIC REVIEW will be sent post free on prepayment of the ANNUAL SUBSCRIPTION OF 6s. 6d.; or it may be had wholesale from Messrs. KENT AND CO., Paternoster Row, or through any Bookseller or Newsagent in the kingdom, price 6d. per copy. Single copy post free from the office, 6½d.

The SCIENTIFIC REVIEW, having an old-established circulation, and being well read by Manufacturers, Capitalists, and others interested in inventions and enterprises for the promotion of industry, will be found a desirable medium to many Advertisers.

All COMMUNICATIONS FOR PUBLICATION, BOOKS FOR REVIEW, and letters respecting ADVERTISEMENTS, SUBSCRIPTIONS, &c.—to be forwarded to the

Editor: 21, Cockspur Street, Charing Cross, S.W.

And if for notice in the next issue, before the 25th instant.

THE INVENTOR'S INSTITUTE,

4, ST. MARTIN'S PLACE, TRAFALGAR SQUARE. LONDON.
ESTABLISHED 1ST MAY, 1862.

President: HIS GRACE THE DUKE OF MANCHESTER.

Past Presidents:

SIR DAVID BREWSTER, K.H., LL.D., F.R.S., &c., from the establishment of the INVENTORS' INSTITUTE, till his decease, February, 1868. LORD RICHARD GROSVENOR, M.P. Sir ANTONIO BRADY, till his decease, 1881.

SESSION 1881—1882.

The last meeting as per list, 8th June, is postponed. The day of meeting will be specially notified.

Subscriptions are payable to Mr. G. A. STRETTON, the Receiver, 4, St. Martin's-place, S.W., who is the proper official to give receipts.

F. W. CAMPIN, Sec.

Proceedings of the Institute.

For Annual General Meeting see another column.

Dr. J. McGrigor Crofts's Paper on Screw Propellers is reserved for our next.

Monthly Notices.

A *New Insulator*, in substitution for gutta-percha or ebonite, has been patented by Dr. Fleming: cotton waste, paper pulp, sawdust, and fibrous matters, rendered impervious by pressure, are the constituents.

The Siphonoid, the name of a new instrument for distributing sulphurous anhydride, which has been demonstrated to be one of the most powerful disinfectants, is described in *The Archives des Sciences* by M. Fatie.

The Illumination of Conservatories by the Electric Light, by the naked rays were, according to a paper in *Les Mondes*, found to be injurious to the plants, but the light when passed through glass globes did not appear to affect them. Nocturnal illumination is not fatal to plants, but there is no proof that it is beneficial. Upon the whole, M. l'Abbé Moigno says, the results obtained at the Palace of Industry were not favourable.

Kola Nut.—MM. Hecket and Schlagdenhausen brought before the Academy of Sciences at the Seance of March 20th a paper on the kola nut (seeds of *Sterculia acuminata*). They show that this nut contains in a free state more caffeine than the finest coffees, a considerable quantity of theobromine and much glucose, three times the starch of theo-broma, little fatty matter, and some tannin.—*Athenæum.*

Darwinism.—A list of articles published in the periodicals of England and America by, or relating to, Mr. Darwin is given in the new edition now preparing of Mr. Poole's "Index to Periodical Literature."

The Hopkins Prize.—The adjudicators of the Hopkins Prize for the period 1871-73 have awarded the prize to Lord Rayleigh, F.R.S., Professor of Experimental Physics in the University of Cambridge, for his various important papers connected with the theory of vibrations, and particularly for his paper "On the Theory of Resonance."

Risks from Fire Arising from the Use of the Electric Light.—The Society of Telegraph Engineers and of Electricians has appointed the following committee to consider and report upon the risks from fire arising from the use of the electric light: Prof. W. G. Adams, Sir Charles T. Bright, T. Russell Crampton, R. E. Crompton, W. Crookes, Warren De La Rue, Profs. G. C. Foster and D. E. Hughes, E. Graves, W. H. Preece, Alexander Siemens, Spagnoletti, A. Stroh, and Sir William Thomson.

The Darwin Memorial.—The executive committee held their first meeting in the rooms of the Royal Society on the 16th ult. On the general committee are the French, German, and Italian ambassadors, the two archbishops, three dukes, Lord Salisbury, Lord Ducie, Lord Derby, Lord Granville, and Lord Spencer, the Vice-Chancellor of Cambridge University, the Master of Balliol, and the Dean of Christchurch, a large number of Fellows of the Royal Society, Mr. Tennyson, Mr. Browning, and others. The hon. secretaries are Prof. Bonney and Mr. P. E. Dove, to whom subscriptions should be sent. The American Minister, Sir J. Hooker, Sir J. Lubbock, Mr. Spottiswoode, Profs. Huxley, Flower, and Tyndall, Dr. Siemens, and others are on the executive committee.

Dephosphorisation of Iron.—At a recent meeting of the Society of Arts a paper was read, by S. G. Thomas and Percy C. Gilchrist, on the manufacture of steel and ingot iron from phosphoric pig-iron. The authors, after stating that nearly nine-tenths of the iron ores of Europe were so phosphoric as to produce a pig-iron unfit for steel making without a process of dephosphorisation showed that by the new lime process perfect dephosphorisation was produced, so that the steel made from phosphoric pig was actually purer than that made from hematite iron. They then instituted a comparison between the basic Bessemer process and the puddling process, pointing out that the former process was peculiarly adapted to the manufacture of soft, weldable steel, having all the characteristics of puddled iron, with considerably greater strength, elasticity, and ductility. This soft, basic, Bessemer steel could be made for some shillings a ton less than ordinary puddled iron, while an economy of seven shillings a ton was gained in its subsequent treatment by the smaller loss which it undergoes in rolling.

THE SCIENTIFIC REVIEW
AND
Scientific and Literary Review
INCORPORATING THE "JOURNAL OF THE INVENTORS' INSTITUTE."

JUNE, 1882.

THE TELEPHONE PATENTS.

THE Electric Telephone has just had to pass through one of the ordeals which important inventions have to include in their histories. What sort of relation the devising and appreciation of Inventions have to the monkey tribe from which by "Evolution" mankind progressed we know not nor care; this much, however, is clear, that we English are by no means too ready to make much of inventive efforts. So much is this the case that some people say our great inventions come from America, some say from France. For our own part we consider that America is the loving nurse-mother of Invention, although any mere fathers may claim birthright. These views will be readily verified by the result of the great Patent case (lasting over fourteen days) entitled "The United Telephone Company (Limited) *v.* Harrison, Cox-Walker, and Co.," in which His Lordship, Justice Fry, gave judgment on the 19th May, 1882; the plaintiffs taking action as owners of the patents in this country for telephones, one taken out provisionally in December, 1876, as a communication from abroad, to secure inventions by Professor Graham Bell, the other taken out in August of the following year by Edison. Bell, as is admitted by every one, including the witnesses for the defendants, was the first inventor of telephony as it is now understood—that is to say, of instruments capable of transmitting to a distance the effect of articulate speech so as to be heard by a listener—and this he did by the application of a magneto-electric law discovered by Faraday some 50 years ago, at the same time breaking away from the idea that seems to have pervaded the minds of persons working towards discoveries in sound telegraphy that the effect must be produced by the regulation of a making and breaking of contract in an electric circuit. Bell carried out his purpose by an undulatory change in an electric current in a closed circuit by means of and in correspondence to the air vibrations produced by the human voice; in fact, in one form of his instrument he does not employ a battery at all, and in all cases the work (so to speak) is done by the human voice. This the witnesses all look on as a most important part of the discovery. The fact, however, that this work is done by the voice limits the power of the instrument, and Edison's invention was of a transmitting instrument by which the voice is employed to modify the tension of an electric current in an undulatory manner corresponding to the speech vibrations of the air, and to produce on a receiving instrument at a distance an intensified effect. In Bell's complete telephone as finally patented the receiving intrument, at which the ear of the listener is placed, is an exact counterpart of the transmitting instrument, into which the sender of the message directs his voice, the operation of the instrument being reversed only. The whole apparatus used by the plaintiff company consists of an Edison transmitter and a Bell receiver, connected by a galvanic circuit. The plaintiff's sued to restrain infringement of both patents. They gave particulars of infringement of Edison's patent by a transmitting instrument made under a patent taken out by a Mr. Hunnings, a clergyman, subsequently to Edison's patent, and of infringement of Bell's patent by a "Cox-Walker" receiver and also by a "Hickley" receiver, which latter, like Bell's, is capable of acting reciprocally as transmitter or receiver. It was not denied that the two latter were infringements of Bell's patent, if the patent could be upheld, but objections to the validity of the patent were raised. The first was on the ground that it had been anticipated, more particularly by the exhibition of an instrument brought by Sir William Thomson from America, the gift of Bell, and mentioned by Sir William in his sectional address at the meeting of the British Association at Glasgow in September, 1876; the other objections were on the construction of the specification. With regard to "Hunnings's" or the transmitting instrument, the defendants contended that it was made under entirely different principles, which had been independently worked out by Mr. Hunnings, and that his instrument did not infringe Edison's patent. Objections were also raised on the construction of the specification, the most important of which was that, of the three claims Edison makes by the patent in its present form, the last is for the "phonograph"—a purely mechanical instrument. and not actually used in connexion with a telephone at all; and the defendants contended that this claim was in excess of the provisional specification. The plaintiffs, on the other hand, endeavoured to bring it within the general scope of the provisional specification as a recording instrument. Bell's interchangeable instrument in its present form consists of a metal disc capable of magnetic action within the magnetic field of either a permanent or an induced magnet, which is enclosed within a coil of wire that forms part of a circuit carried to the instrument at the other end. If the instrument is used as a transmitter the voice is spoken on to the metal disc, which vibrates in conformity with the voice waves of the air and produces a corresponding undulatory magnetic change in the magnet, which again, under Faraday's law, induces or modifies a galvanic current in the wire circuit in corresponding galvanic undulations. These, in their turn, produce in the magnet of the receiver corresponding undulatory changes, which, again, cause the disc at that end to vibrate in a corresponding manner, and give to the air a sound undulation corresponding to the voice of the speaker at the other end. In the Glasgow instrument the transmitter and receiver were not alike, and the defendants did not set up that the whole instrument was workable, but only that a skilled workman, by looking at the receiver, could make an instrument that would act as a good receiver with such a transmitter as can now be made. That differed from the present form of receiver in appearance considerably. It was a metal cylinder with a lid, apparently fastened at one part and, as his Lordship held, slightly tilted up. The poles of the magnet were differently arranged, and it was evidently designed to be used with a strong battery; but the question of difference, which was most important, was whether the lid, which is the part that answers to the disc of the present instrument, was intended to lie flat and act as a tympanum or to be tilted up and have a certain amount of vibration of its own. Edison's instrument is a combination of a mica disc which is in mechanical connection with a platinum electrode, which presses on a layer of lampblack which forms part of the closed galvanic circuit. The disc, acted on by the voice, produces undulatory change of pressure on the lampblack, which by change of electrical resistance produces undulatory variation in the electric current corresponding to but more intense than those produced by Bell's instrument used as a receiver. In "Hunnings's" instrument there is no disc. The voice is spoken on to a platinum foil, which touches a layer of fine "coke." Most eminent electricians have given evidence on both sides. Among the plaintiff's witnesses were Sir Frederick Bramwell, Sir William Thomson, Dr. Hopkinson, Mr. Imray, and Mr. Johnson, the agent for Mr. Edison. On the other side were Professor Sylvanus Thompson, Dr. Muirhead, Professor Dolbear, Professor Barrett, and Professor Ayrton. We may notice, for the information of those who are curious as to what becomes of Senior Wranglers, that a Senior Wrangler was in the box examined by one Senior Wrangler and cross examined by another. With respect to the Bell instrument used as a receiver, three cases of anticipation had been set up. The first of these was an instrument invented by Reis, a German, about 1860, for the purpose of transmitting musical notes by telegraphy. The receiver of that instrument did not appear to be so much relied upon as the other two cases of anticipation, and his Lordship held that there was nothing like an anticipation of the Bell receiver. The second anticipation relied upon was the alleged publication of another form of this instrument in this country by means of a description in a German "Zeitschrift" of electricity, copies of which are kept in two public libraries in London, accessible to men of science, and it was attempted on the part of the plaintiffs to exclude the consideration of this instrument on the ground of its being in German. His Lordship, however, held that, as it was shown that Dr. Muirhead had seen the article in the "Zeitschrift," and though he did not understand German, but as a specialist was acquainted with the technical words and had the aid of plates, there was sufficient to enable him to have made the machine, and there was publication. But, on the other hand, he considered it plain that the armature in Reis's instrument was not a disc at all, and was not intended to operate at all in the same way as Bell's. The third case of anticipation set up was the exhibition by Sir William Thomson to the meeting of the British Association at Glasgow in September, 1876, of the instrument that had been presented to him by Bell at Philadelphia and the description given by Sir William in his address as President of a section. His Lordship observed that no doubt in this court that instrument had been made to speak, but it was only with a great amount of electric power and with a sevenfold transmitter constructed for the purpose, but it was not in evidence that any one had ever made such an instrument speak before the date of Bell's patent. He came to the conclusion that the contact-plate was on the tilt, and any person was likely to suppose from the look of it that it was intended to operate, partly, at least, as a free tongue, and, on the whole, he came to the conclusion that the thing was at that time merely in an experimental stage and there was at that time merely an experimental stage and there was no anticipation. In the next place his Lordship disposed of the objections the defendant had taken to the validity of Bell's patent on the construction of the specification, one of which was that by the first claim what was claimed was really the discovery which Faraday made 50 years ago. This claim, however, his Lordship considered, read together with the whole specification, was limited to the application of Faraday's discovery to the invention of Bell, especially as the body of the specification explicitly treats Faraday's discovery as being well known. His Lordship then passed to the consideration of the Edison part of the case. First, he considered the meaning of the expression "tympan or diaphragm," as used by Mr. Edison. He thought that they were to have their ordinary signification, as there was nothing in the specification to show the contrary, and that Hunnings's foil electrode was included in the description. He also considered that the material (coke) used by Hunnings was within description of the material described by Edison as fit for his tension regulator, and that Hunnings's device was a modification or improvement of Edison's and was an infringement. His Lordship proceeded to consider the argument raised that the first of Edison's claims for a "mica" tympan or diaphragm was bad, because it was a claim for the application of a particular material to a known thing—namely, a tympan. In his opinion, if that were the claim simply, it would be bad; but it was limited by the words "substantially as set forth" to a tympan for the purpose of the invention, and was a good claim. There remained only the question which had been raised in the "phonograph"—the third of Edison's claims. That, his Lordship held, was a distinct mechanical invention, and not sufficiently foreshadowed in the provisional specification; and, after having decided all other points on the Edison part of the case in the plaintiffs' favour, avoided the patent on this question of construction. His Lordship granted an injunction to restrain the infringement of Bell's patent by the sale of the Cox-Walker and Hickley instruments, with costs, so far as related to that part of the action, and, in accordance with the Patent Law Amendment Acts, gave the necessary certificate to enable the plaintiffs to get complete costs. And on the Edison part of the action he dismissed it, with costs, but without any certificate as to particulars of objections.

Mr. Aston, Q.C., Mr. Webster, Q.C., Mr. Cozens-Hardy, Q.C., and Mr. Moulton appeared for the plaintiffs; Mr. J. Pearson, Q.C., Mr. Hemming, Q.C., Mr. Goodeve, and Mr. F. L. Muirhead for the defendants.

It may be observed that though the plaintiffs lose the action on the transmitter part of the case, it does not follow that the patent will not be made good for future purposes by a new disclaimer.

In connection with this decision, the following letter appears in the *Times*:—

Sir,—As scientific adviser to the gentlemen who own the instrument known as the Hunnings' transmitter, which has been the subject of the litigation in which Mr. Justice Fry's decision was rendered to-day, I desire to remark that although by to-day's decision Edison's patent, which the plaintiffs claimed to cover Hunnings' invention, has been pronounced void, yet there are, independently of the general voidance of Edison's patent, grounds for holding that Hunnings' invention is absolutely distinct from Edison's. Edison claimed as his telephonic transmitter a combination of a tympan or dispragm with a tension-regulator, naming as materials for the latter lamp-black, plumbago, platinum, &c. He does not claim the use of these materials apart from a tympan or disphragm. In Hunnings' transmitter coke is used, and the mechanism of Edison's telephone, including the mica diaphragm or tympan, the adjusting springs or screws, and the cork presser wherewith to act upon this material, has been wholly rejected as in Hughes's well-known microphone. The result of this is that the voice is transmitted much more perfectly by Hunnings' transmitter, because the sound waves act directly, instead of acting through the indirect mechanism of the combination which Edison claims. It must be confessed that it is difficult to understand how Mr. Justice Fry can regard Edison's mica disc fixed at its edges as not being a "tympan," when he himself in his judgment says, "I do not forget it has a certain operation as a tympanum."

Again, Mr. Justice Fry has stated that Reis's telephones of 1863 were found "occasionally and uncertainly to reproduce vocal sounds with musical ones," and he appears to regard the transmission of speech by such instruments as being a mere accident, and not the intention of the inventor. This is at least remarkable when we find in the instructions isssued with those early instruments definite directions as to what to do in order to notify the operator by signals when to speak to the transmitting instrument and when to sing to it, which instructions would not have been given unless the instrument had been intended to speak as apart from singing.

Whatever may be the ultimate issue of this decision, the public, at least, will not suffer by the creation of a healthy competition with the existing monopoly; and it is worth while to point out that if Edison's claim to monopolize all the practical carbon transmitters, such as those of Blake, Hunnings, and Crossley, be now at an end. there is also, at least, one other practical telephone receiver besides that of Bell, viz., that of Dolbear, which has lately been introduced into this country, and promises to be even more successful than that of Bell for telephoning over long distances.

I am, Sir, your obedient servant,
SILVANUS P. THOMPSON.

University College, Bristol, May 19.

CAPE DIAMONDS.

AT a late meeting of the Académie des Sciences an account was given by Mr. Roscoe of some curious experiments recently made into the nature of the "Cape Diamonds." After the first enthusiasm excited by the discovery of these diamond fields, a reaction set in, as it will be remembered, to the detriment of the new industry, on account chiefly of the inferior colour noticed in almost all of the diamonds. Instead of the purity for which the best stones are most highly prized, the African diamonds showed tints of various colours, most usually some shade of yellow, but also occasionally pale violet, resembling the amethyst, light green, or even smoky patches. Another grave complaint against them was found in their real or supposed propensity to burst in pieces with little or no provocation. The wisemen have long declared that both these defects must be due to the admixture of some baser substance with the material of the diamond; but the theory, however plausible, has remained a theory only, unconfirmed by anything in the shape of practical argument. The difficulty which beset the experimentalists is intelligible enough. They were not disposed to lay out their money in the purchase of such expensive toys for the purpose of destroying them in the unselfish desire to benefit chemical and geological science. This was a matter in which the well-known maxim *fiat experimentum in corpore vili* was altogether inapplicable; and until Mr. Roscoe put his hand to the work, the mystery was never fairly cleared up. This gentleman set to work by burning Cape diamonds in oxygen, by which process the true stones vanish gracefully by transformation into carbonic acid. But the Cape products, instead of completely disappearing in this quiet fashion, have been found to leave behind them a sort of ash, or residue, which is incombustible in oxygen. What the residue consists of he is not yet in a position to say. But it is something to have proved that the essential virtue of the diamond remains free "from a stain on its character," the blemishes being due, not to any vice in the stone itself, but only to its having been corrupted by evil communications.

MEASURING.—Mr. James H. Peters, of Nechesville, Texas, has patented an improvement in cloth-measuring reels, designed principally for measuring bagging, carpets, &c. The invention consists in the peculiar combination and arrangement of the cutting board with two standards, whereby the cutting board is made to act as a sufficient brace for the frame as well as to perform the offices of a cutting board.

Proceedings of Societies.

ROYAL SOCIETY.

April 27.—The President in the chair.—The following papers were read:—"On the Attitude of Animals in Motion," by Mr. Muybridge,—and "Preliminary Account of the Structure of the Cells of the Liver, and the Changes which take place in them under various Conditions," by Mr. J. N. Langley.

May 4.—The President in the chair.—The list of names of candidates recommended for election was read.—The following paper was read:—"On the Specific Resistance of Mercury," by Lord Rayleigh.

May 11.—The President in the chair.—Sir Bartle Frere was admitted into the Society. —The following papers were read:—"Sur l'Inversion Générale," by M. T. S. Vanecek, and "On the Organization of the Fossil Plants of the Coal Measures," Part XII., by Prof. W. C. Williamson.

GEOLOGICAL SOCIETY.

April 16.—Mr. J. W. Hulke, President, in the chair.—The following communications were read:—"On Fossil Chilostomatous Bryozoa from Mount Gambier, South Australia," by Mr. A. W. Waters,—"Thamniscus: Permian, Carboniferous, and Silurian," and "On the Occurrence of a New Species of Phyllopora in the Permian Limestones," by Mr. G. W. Shrubsole,—and "On the Relations of the Eocene and Oligocene Strata in the Hampshire Basin," by Prof. J. W. Judd.

May 10.—Mr. J. W. Hulke, President, in the chair.—Mr. A. Leech was elected a Fellow, and Prof. L. Rütimeyer a Foreign Member.—The following communications were read:—"On the Relations of Hybocrinus, Baerocrinus, and Hybocystites," by Mr. P. H. Carpenter, communicated by Mr. Duncan,—"On the Madreporaria of the Inferior Oolite of the Neighbourhood of Cheltenham and Gloucester," by Mr. R. F. Tomes,—"On the Exploration of Two Caves in the Neighbourhood of Tenby," by Mr. E. L. Jones, communicated by Prof. W. Boyd Dawkins,—and "Note on the Comparative Specific Gravities of Molten and Solidified Vesuvian Lavas," by Mr. H. J. Johnston-Lavis.

THE INSTITUTION OF CIVIL ENGINEERS.

May 2.—Mr. E. Woods, V.P., in the chair. —It was announced that the Council had recently transferred Messrs. W. Harvey, J. Hopkinson, and S. Stent to the class of Members, and had admitted seven Students. —At the monthly ballot, three Members, twenty Associate Members, and one Associate were elected.

May 9.—Sir F. Bramwell, V.P., in the chair.—The paper read was:—"On Coal Washing," by Mr. T. F. Harvey.

May 16.—Sir. F. Bramwell, V.P., in the chair.—The following papers were read:—"On the various systems of Grinding Wheat, and on the Machines used in Corn-Mills," by Mr. W. P. Baker,—"On Modern Flour-Milling in England," by Mr. H. Simon,—and "On Roller-Mills and Milling as practised at Budapest," by Mr. W. B. Harding.

ROYAL INSTITUTION.

May 1.—Annual Meeting.—Dr. T. Boycott, F.L.S,, Manager, in the chair.—The annual report of the Committee of Visitors for the year 1881, testifying to the continued prosperity and efficient management of the Institution, was read and adopted. The real and funded property now amounts to above £85,400, entirely derived from the contributions and donations of the members.—The following gentlemen were elected as Officers for the ensuing year:—President, The Duke of Northumberland; Treasurer, G. Busk; Secretary, Dr. W. Bowman; Managers, Right Hon. R. Bourke, Dr. T. Boycott, J. Brown, Dr. Warren De La Rue, Col. J. A. Grant, Hon. Sir W. R. Grove, Right Hon. Lord Claud Hamilton, C. H. Hawkins, Sir J. Hawkshaw, Dr. W. Huggins, J. F. Moulton, Sir F. Pollock, H. Pollock, Dr. J. Rae, and W. Spottiswoode; Visitors, J. Birkett, C. J. Busk, G. F. Chambers, F. Crisp, H. H. S. Croft, A. J. Ellis, C. Lyall, Dr. R. Mann, Dr. H. Maudsley, W. H. Michael, H. W. Müller, L. M. Rate, Hon. Rollo Russell, J. B. Sedgwick, and G. A. Spottiswoode.

May 8.—Mr. W. Spottiswoode, Manager, in the chair.—Mrs. C. W. Mitchell, Mrs. A. Siemens, Col. F. R. W. Sibthorp, Dr. A. Meadows, and Messrs. R. C. Baxter, G. Christian, C. Combe, C. Haag, J. J. E. Mayall, A. Siemens, and A. J. Wright were elected Members.—Prof. Tyndall was re-elected Professor of Natural Philosophy.

SOCIETY OF ENGINEERS.

May 1.—Mr. J. Church, President, in the chair.—A paper was read "On the Utilization of Tidal Energy," by Mr. A. Oates.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

May 2.—Dr. S. Birch, President, in the chair.—The Rev. A. Löwy read a paper entitled "Notices concerning Glass in Ancient Hebrew Records."—A paper was read by Mr. G. Bertin "On the Rules of Life among the Ancient Akkadians."

PHYSICAL SOCIETY.

April 22.—Prof. Clifton in the chair.—Dr. G. Hopkinson was elected a Member.—The President announced that copies of the report of the Lightning Rod Company could be had of Dr. Guthrie, Science School, South Kensington, price 5s.—Mr. W. F. Stanley read a paper on the evidence of a flowing liquid moving by rolling contact on the interior of a pipe.—Mr. S. W. Whittle exhibited the Kew magnetograph curves taken during the past week of the magnetic storm.—It was announced that the meetings of the Society in May would be held on the 6th and 20th, instead of on the 13th and 27th as already announced.—By the kindness of the President, Prof. Clinton, a meeting would be held on June 17th at the Clarendon Laboratory, Oxford.

May 6.—Prof. Clinton, President, in the chair.—Mr. W. H. Heaton was elected a Member.—Mr. Lecky exhibited a cheap form of cell devised by Mr. A. Bennett, of Glasgow.—Dr. Guthrie read a paper, by Dr. R. F. Brown, "On Mercury Thermometers."—Dr. Guthrie gave results of measurements on the vertical repulsion between a suspended horse-shoe magnet and a rotating copper disc. The repulsion appeared to vary in paoportion to the square of the rotation.

SHORTHAND SOCIETY.

May 2.—Mr. C. Walford, President, in the chair.—Messrs. Dicks, Murray, and Westby-Gibson, jun., were elected Members.—Mr. J. G. Petrie read a paper "On Reporting and Transcribing Machines." The Danish, Bartholomew, and Michela machines and their capabilities were minutely explained. The last named machine is in use in the Italian Senate, but Mr. Petrie showed, by a careful analysis of the results, that what was attributed to it was mainly due to its work being checked by a large staff of reporters and revisers, while the reports, before appearing in print, are eventually corrected by the speakers themselves. Though he would hail with satisfaction any mechanism which would assist the shorthand writer in his arduous duties of note-taking, he did not believe that any of the existing machines could do better work than could be done with the old note-book and pen or pencil; at the same time he advocated, from actual experience, the use of the type-writer for the transcription of notes, as it not only got out the "copy" more expeditiously and legibly, but always afforded a salutary change from the drudgery of the pen. The paper was illustrated by machines and drawings, and expert writing, averaging sixty words a minute, was shown with the type-writer.

GEOGRAPHICAL SOCIETY.

May 8.—Right Hon. Lord Aberdare, President, in the chair.—The following gentlemen were elected Fellows:—Messrs. D. B. Blair, S. Browne, H. C. A. Conybeare, W. B. Gurdon, H. M. Hughes, and H. B. Ince.—The paper read was "Surveys and Explorations in the Native States of the Malayan Peninsula, 1875 to 1882," by Mr. D D. Daly.

SOCIETY OF ANTIQUARIES

May 4.—Mr. Freshfield, V.P., in the chair.—The nomination of Mr. J. Evans as Vice-President was read.—The Chairman called attention to the Bishop of London's "Union of Benefices Bill," the effect of which, as he believed, would be to add eight or nine to the list of interesting, historical, and architectural buildings which had been destroyed in the City of London.—A resolution was passed calling the attention of the Earl of Carnarvon, President, to the proposed measure, and expressing a hope either that the Bill would not be allowed to pass into law, or that clauses might be introduced which would avert the destruction with which some of the most interesting churches in the City of London were now threatened. —Mr. R. Day exhibited two matrices of foreign mediæval seals of ecclesiastics.—Mr. J. H. Middleton communicated a note on an interesting discovery which had been made in the library of the Deanery of Westminster. On removing some of the boards of the floor a pavement of encaustic tiles was discovered. It is possible that this may eventually, on further examination, prove to be the floor of the chapel of the old abbot's house, the position of which has hitherto been a matter of doubt.—Mr. F. M. Nichols laid before the Society an historical poem of the fifteenth century on the mutability of fortune, illustrated by the fate of Eleanor Cobham, and the deaths of John, Duke of Somerset, and Humphrey, Duke of Gloucester, and containing some interesting particulars as to the cause of King Henry's animosity. It appears to have been believed that one of the bishop's (probably William Ayscough, Bishop of Salisbury) had revealed to the king some information respecting Duke Humphrey's acts and intention which he had learnt in the confessional—a scandalous imputation which may have helped to bring about the murder of Bishop Ayscough on the 29th of June, 1840.—The Rev. J. Barron read a paper on certain representations of St. George and the Dragon, in continuation of a previous paper on the same subject.

May 11.—Mr. A. W. Franks, V.P., in the chair.—Mr. J. Plant exhibited a bronze sheath of "late Celtic" work, found in draining Pilling Moss, Lancashire, in 1859. —The Rev. W. F. Creeny communicated a description of forty brasses from Belgium and Germany, of which he had himself taken rubbings during the last three years.

ARCHÆOLOGICAL INSTITUTE.

May 4,—Mr. T. H. Baylis in the chair.—A communication from the Rev. C F. R. Palmer was read, consisting of notes on the Priory of Dartford, Kent, compiled from the Dominicans at Rome, to which Mr. Palmer has been permitted access by the courtesy of the present head of the order. These extracts supplement in several particulars the learned history of the nunnery by Mr. Palmer, published in vol. xxxvi. of the *Journal* of the Institute. Instances occur of permission to the sisters to use linen garments, in one instance "propter debilitatem et antiquitatem;" of sisters being allowed to speak with friends of honourable fame in the common speaking room, or locutorium; of assignments of confessors, and the like.—A paper by Canon Venables, on Carrow Priory, Norwich, was read. This house, also a nunnery, was so utterly demolished at the Dissolution that nothing of it remained, except the prioress's house, which was turned into a dwelling-house, and the cores of the walls of the cloister garth (for the stone settings had all been removed), which were preserved to enclose a garden. All the rest was underground, invisible, and forgotten. At a meeting of the Congress of the Archæological Association, in 1879, attention was drawn to the subject, with the result that a complete course of excavation was commenced, and has been completed at the cost of the proprietor, Mr. J. J. Coleman, one of the members for Norwich, to whose munificence in this matter archæology is greatly indebted. Remains have been brought to light, under the superintendence of Mr. A. S. King, of the church, chapter room, slype, day room, and other offices. Canon Venables in his paper drew attention to the circumstance that the scene of one of the poems of Skelton, *temp.* Henry VII., is laid at Carrow. It is called a "Little Boke of Philip Sparow," being a jocular "lament" for the loss of a pet bird belonging to one of the inmates of the nunnery, Mistress Jane Scrope. Carrow is almost unnoticed in the ordinary histories of the locality.—The Rev. Edward King exhibited a dish, bearing the name of "Thomas Toft," which he has had the good fortune to pick up near Werrington, in the county of Devon. The dish, though not the largest of the few known specimens of the "Toft" dishes, is one of the best in point of execution. The design is that of the royal supporters, a lion and unicorn, with a floriated stem between them. The dish also bears the initials T. L.—Capt. Hoare exhibited one of the foundation medals of the Archæological Association, dated in 1843, before the secession of the Institute in 1846.

ZOOLOGICAL SOCIETY.

May 2.—Prof. W. H. Flower, President, in the chair.—Before commencing the usual proceedings, the President called attention to the fact that one of the communications made to the previous meeting was from the pen of Mr. Darwin, and took the opportunity of referring to the labours and character of the illustrious naturalist.—Mr. Sclater exhibited a drawing of a tapir presented to the Society by Mr. F. Zurcher in August last, which had been captured on the Yuruari river in Venezuela. Mr. Sclater observed that in form and colour this animal seemed to agree better with *Tapirus Dawii* than with the ordinary *T. Americanus*, and suggested that it was quite likely that the former species might be the tapir of the northern coast-region of Columbia and Venezuela.—Papers were read: by Mr. J. E. Harting, on the desirability of adopting a standard of nomenclature when describing the colours of natural objects,—by Dr. H. Gadow, on the structure of feathers in relation to their colour, in the course of which he endeavoured to show how the optical appearances of the various colours met with in the feathers of birds were produced,—by Prof. Flower, on the cranium of a cetecean of the genus Hyperoodon from the Australian seas, upon which he proposed to found a new species, *H. Planifrons*,—from Dr. O. Staudinger, on some new and interesting species of Rhopalocera from the New World,—from Mr. H. J. Elwes, on a collection of butterflies made on the Tibetan side of the frontier of Sikkim, amongst which were examples of several species new to science,—and from Mr. E. L. Layard, on a new species of parrot of the genus Nymphicus from Uvéa, one of the Loyalty Group, which he proposed to call *Nymphicus Uvæensis*.

CHEMICAL SOCIETY.

May 4.—Dr. Gilbert, President, in the chair.—Prof. J. Dewar delivered a lecture "On the Recent Development of the Theory of Dissociation."

PHILOLOGICAL SOCIETY.

May 5.—Mr. A. J. Ellis, President, in the chair.—A paper entitled "Some Notes on Grammar" was read by Mr. E. L. Brandreth. It was contended that words ought to be classed as parts of speech with reference to their functions in a sentence, not by attaching meanings to them independent of such functions, and that some of these functions were primary, others secondary. It was next observed that the grammar, especially of modern languages, was usually treated in accordance with a fixed order of ideas, which was determined to a great extent by the forms of the Latin grammar, whereas it was held that the mode of formal expression of each language should be made as far as possible to determine the order of ideas—that the genius of a language could not otherwise be properly represented. The paper concluded with a reference to compound words. It was held that it was form, not meaning, that made true compounds.

SOCIETY OF ARTS.

May 5.—Sir G. Birdwood in the chair.—A paper "On Experiences of a European Zemindar (landholder) in Behar" was read before the Indian Section by Mr. J. Mylne.

May 8.—Mr. H. T. Wood in the chair.—The first of the present course of Cantor Lectures "On Book Illustration, Old and New," was delivered by Mr. J. Comyns Carr. The lecture was devoted to a consideration of the proper relation of printed text and illustrated design and to the general history of the art

May 10.—Mr. E. Birkbeck in the chair.—A paper "On the Fish Supply of London" was read by Mr. Spencer Walpole, H.M. late Chief Inspector of Salmon Fisheries.

ANTHROPOLOGICAL INSTITUTE.

April 25.—Dr. Hyde Clarke, V.P., in the chair.—It was announced that Mr. A. Morrison and Mr. F. Harold had been elected Members.—The Chairman referred at some length to the loss that anthropological science had suffered by the death of Mr. Darwin, an honorary member of the Institute.—Prof. Flower also offered a tribute to Mr. Darwin's memory.—Mr. E. H. Man read another paper "On the Aboriginal Inhabitants of the Andaman Islands." He touched first upon the important subject of language, and pointed out certain peculiarities connected with the varying use of several sets of possessive pronominal adjectives with particular classes of nouns. In expectation at an early date of a paper on the South Andaman language by the President of the Philological Society, this subject was briefly dealt with by the author, who next proceeded to describe the Andamanese system of adoption and the recognised degrees of affinity, especially as bearing on the question of marriage, bringing to notice at the same time the erroneous opinions hitherto held on the latter point, as also about their death and burial customs. Numerous superstitions, beliefs, and traditions were related. Mr. Man was careful to state that he had taken the precaution to obtain his information from members of distant tribes, who had had no opportunity of intercourse with Europeans or other aliens residing at Port Blair; and he added that it was extremely improbable, for the reasons noted in his paper, that any previous generations within historic times of these islanders could have obtained their versions from strangers.

May 9.—Major General Pitt Rivers, President, in the chair.—Mr. H. L. Roth was elected a Member.—Mr. G. M. Atkinson made some remarks on a palæolithic implement found eighteen feet below the bed of the Thames at Chelsea and exhibited by Mr. L. Young, and on a jet ornament from Garvagh, co. Londonderry, exhibited by Mr. A. G. Geoghegan.—Mr. W. G. Smith exhibited a series of large palæolithic implements recently discovered.—Dr. Beddoe read a paper "On the Evidence of Surnames as to Ethnological Changes in England." The discussion was sustained by Messrs. Hyde Clarke, Holt, Harrison, Prideaux, Atkinson, C. Roberts, and the Chairman.—Mr. P. Harrison read a paper "On the Survival of Certain Racial Features in the Population of the British Isles at the Present Day." Dr. Beddoe, Prof. Thane, Mr. Atkinson, and the President joined in the discussion.

ARISTOTELIAN SOCIETY.

May 1.—Mr. R. S. Hodgson, President, in the chair.—A discussion took place on "Perception and its Dependent Ideas, Percept, Presentation and Representation, Similarity and Dissimilarity, Comparison, and Intuition."

ASTRONOMICAL SOCIETY.

May 12.—Mr. E. J. Stone, President, in the chair.—Messrs. H. G. Hollingworth, S. Okell, W. B. Roué, and H. G. Williamson were elected Fellows.—Mr. Downing read a paper "On the observation of γ Draconis with the Greenwich Reflex Zenith Tube during the Years 1857 to 1875," from the discussion of which the author obtained a value for the constant of aberration of 20″·378, and for the constant of nutation of 9″·3353.—Mr. Common showed an arrangement for illuminating the wires of micrometers with a small incandescent electric light. He also exhibited photographs which he had obtained of the central portion of the nebula in Grion, in which a large amount of detail was visible.—Mr. Marth read a paper on an apparatus, which he exhibited, for determining those errors in astronomical observations which are caused by flexures of the instrument.—The Astronomer-Royal read a paper "On the Spectrum of Comet Wells" (*a*, 1882), which had been observed at Greenwich. A continuous spectrum only had been seen, without bright bands.—Mr. Howlett showed a number of drawings of solar spots, and called attention to the recent outbursts of solar activity; and the Astronomer-Royal mentioned that outbursts on April 13th and 17th had each been followed within a few days by violent magnetic storms.—The following papers were also annonnced and partly read: "The Nebula near Merope," by Mr. T. W. Backhouse.—"Observations of the Phenomena of Jupiter's Satellites made at Mr. E. Crossley's Observatory," by Mr. J. Gledhill,—"Elements of the Orbit of Comet Wells," by Mr. A. Graham,—"The great Sun Spots of April, 1882," by Mr. H. Pratt,—and "Determination of the Orbit of η Cassiopeiæ," by Mr. J. B. Coit.

ASIATIC SOCIETY.

May 15.—Anniversary Meeting.—Sir E. Colebrooke, Bart., President, in the chair.—Capt. E. Talbot, Mr. P. Mukerji, and Mr. N. P. Sinha were elected non-Resident Members.—The following were elected as the Council and Officers for the ensuing year: President, Right Hon. Sir Bartle Frere; Director, Sir H. C. Rawlinson; Vice-Presidents, Sir E. C. Bayley, Sir E. Colebrooke, Sir R. Temple, and Col. Yule; Council, Sir B. Ellis, J. Fergusson, A. Grote, Col. Haig, H. C. Kay, Col. Keating, Lieut.-Col. Lewin, J. W. McCrindle, General Maclagan, H. Morris, Sir L. Pelly, Sir W. Robinson, Lord A. Russell, Lord Stanley of Alderley, and T. H. Thornton; Treasurer, E. Thomas; Secretaries, W. S. W. Vaux and H. F. W. Holt; Hon. Secretary, R. N. Cust.—The report of the Council stated that fifty-five new members had been elected during the past year, and gave brief biographies of deceased members and of others distinguished for various Oriental researches, including Prince Frederick of Sleswick-Holstein, Sir E. Perry, Profs. Benfey, Dowson, and Gregorief, and Messrs. Muir, Krapf, Bransen, and Nain Singh. A notice was also added of the progress of Oriental studies since the last anniversary.

ENTOMOLOGICAL SOCIETY.

May 3.—Mr. H. T. Stainton, President, in the chair.—The President alluded to the interest with which the late Mr. Darwin, who was one of the original members of the Society, had always shown in entomology.—The Secretary read a communication from the secretary of the Field Club, relative to the scientific importance of Epping Forest being preserved in its natural condition "unimproved," and requesting members to join in a memorial to the Conservators to this effect, lest it should be converted into a mere park.—Varieties of *Fidonia atomaria* and *Anchocelis pistacina*, by Mr. W. C. Boyd,—a male of *Cryptus titillator*, by Mr. T. R. Billups,—a hybrid between *Antheræa Pernyi* and *Roylii*, by Mr. W. F. Kirby,—and a curious abnormal growth of the flowers of the ash (produced by a gall-mite), by Miss Ormerod, were exhibited.—Mr. E. A. Fitch called attention to a wooden spherical gall on ash keys, produced by a curculionideous (?) larva. The following papers were read: "Further Additions to Mr. Marshall's Catalogue of British Ichneumonidæ," by Mr. J. B. Bridgman,—a continuation of his "Synopsis of British Hymenoptera," by Mr. E. Saunders,—and "On the supposed Abnormal Habits of certain Species of Eurytomidæ, a Group of the Hymenopterous Family Chalcidæ," by Prof. J. O. Westwood.

METEOROLOGICAL SOCIETY.

May 17.—Mr. J. K. Laughton, President, in the chair.—Miss W. L. Hall, Mr. E. J. Pearson, Dr. J. R. Somerville, and Mr. W. J. V. Vanderbergh were elected Fellows.—The following papers were read: "On the Diurnal Variation of Wind and Weather in their relation to Isobaric Lines," by the Hon. R. Abercromby. By constructing synoptic charts at different hours of the same day, and by comparing the wind and weather records at the different hours, and examining their relation to mean curves of diurnal variation, the author shows that the mean diurnal increase of the wind's velocity is explained by the fact that for the same gradient there is more wind by day than there is by night. The mean diurnal veering of the wind is owing to the fact that in cyclones the wind is a little more incurved, and in anti-cyclones a little more outcurved, by night than by day. The mean diurnal increase of the frequency of rain during the day hours is explained by the fact that in any given cyclone the area of rain is larger by day than by night. The diurnal changes of every element are superimposed on the larger general changes, and are independent of each other. The diurnal veering and increase of rain follow as a natural consequence of the diurnal increase of velocity.—"Mechanical Conditions of Storms, Hurricanes, and Cyclones," by Mr. W. F. Stanley.

MATHEMATICAL SOCIETY.

May 11.—Mr. S. Roberts, President, in the chair.—Mr. A. L. Daniels was elected a Member.—Dr. Hirst spoke upon a general method of inversion due to M. Vanecek.—The following further communications were made: "On a Formula relating to Elliptic Integrals of the Third Kind," by Prof. Cayley,—"Elementary Analytical Proof of Groves's and MacCullagh's Theorems, with an Extension of the former," by Mr. J. Griffiths,—"Note on a System of Confocal Bicircular Quartics," by Mr. R. A. Roberts,—"On the Vibrations of an Elastic Sphere," by Prof. Lamb,—and a short note by the President.

NEW SHAKSPERE.

May 12.—Mr. F. J. Furnivall, Director, in the chair.—The Rev. W. A. Harrison read a paper "On Cursed Hebona" ("Hamlet," I. v.), which he described as complimental to that of Dr. B. Nicholson on the same subject. Premising that the poison intended must be the same as Marlowe's "juice of hebon," he pointed out that the yew-tree is called hebon by Spenser and by other writers of Shakspeare's age: that in its various forms of eben, eiben, ihben, &c., this tree is named in no less than five different European languages. He showed by citations from medical authorities that the juice of the yew is a rapidly fatal poison; that the symptoms in yew poisoning correspond in a very remarkable manner with those which follow the bites of poisonous snakes; and that no known poison but the yew produces the "lazar-like" ulcerations on the body which Shakspeare in this passage lays such stress.—Mr. Furnivall said that Mr. Harrison had produced most interesting medical evidence, and that his paper was quite conclusive as to the meaning of "hebona."—Dr. Nicholson thought that if we continued our research we should find that Shakspeare, in describing the effects of the poison on the elder Hamlet, was quoting from some old medical treatise, as he quotes Holinshed, &c., on matters of history.—Miss Lathom thought that we might find some information in witch-lore, and quoted "Slips of yew, silvered in the moon's eclipse."—A paper "On Macbeth," by Mr. J. C. Gibson, was read.

THE ELECTRIC LIGHTING COMMITTEE.

The Select Committee of the House of Commons appointed to consider the merits of the various measures promoted this Session by gas companies, corporations, and electric lighting companies, for the establishment of electric lighting, sat recently in private to consider their decision. The following resolutions were the result of their deliberations:—

"1. That the Board of Trade be empowered to grant licenses to local authorities, or to private undertakers, with the consent of such local authorities, to supply electricity within a defined area.

"2. That such licenses be for any period not exceeding five years, but may, at the expiration of the licence, be renewable with such consent as aforesaid.

"3. That the Board of Trade be empowered to grant provisional orders to local authorities, or to private undertakers, without the consent of such local authorities, for the supply of electricity; but such provisional orders shall be subject to confirmation by Parliament.

"4. That notice of any application for a licence or provisional order be given by public advertisement in the district, and full opportunity be given to all parties interested to state their case to the Board of Trade.

"5. That no application for a licence or provisional order be granted until the expiration of three months from the notice of such application.

"6. That no application by any local authority for a provisional order under this Act be proceeded with until it has been submitted to a meeting of the local authority, specially summoned for the purpose by public notice.

"7. That licenses and provisional orders should carry with them power to break up the streets for the purpose of laying the necessary wires.

"8. That, where it has been proved to the satisfaction of the Board of Trade that any area as defined by licence or provisional order, is sufficiently supplied with electric light, and that the supply of gas in such area has ceased to be remunerative, the Board of Trade be empowered to make an order relieving, either wholly or in part, any corporation or gas authority from being compelled to supply gas within such area.

"9. That local authorities be empowered to purchase compulsorily the undertaking of any company or person authorised by provisional order to supply electricity at the end of 15 years, or at the end of any subsequent period of five years.

"10. That for the purpose of the purchase of the undertaking, the value of the land, buildings, works, materials, and plant shall be deemed to be their fair market value at the time of the purchase, due regard being had to their nature and their condition, to their state of repair, to their suitability to the purposes of the undertaking, and where a part only of the undertaking is purchased, to any loss occasioned by severance, but without any addition in respect of compulsory purchase, or of goodwill, or of any past or future profits, or of any similar consideration.

"11. That licenses and provisional orders should contain such regulations—(*a*) For securing the safety of the public from injury to life, or from fire; (*b*) for inspection; (*c*) for securing a regular and efficient supply of electricity; (*d*) for fair prices—as experience may prove to be necessary; and where it has been proved to the Board of Trade that public safety is likely to be endangered, they shall at all times have power to make such further regulation as may be required for securing the safety of the public.

"12. That overhead wires be forbidden without the consent of the local authority; and where it has been proved to the satisfaction of two justices of the peace or corresponding authority that any such wire is or is likely to become dangerous to the public safety, they may make an order directing it to be removed upon such terms as they may think fit.

"13. That local authorities supplying the electric light be required to keep separate accounts of such undertaking, and to publish them in detail for the information of the ratepayers.

"14. That the Board of Trade be required to submit to Parliament an annual report of their proceedings under this Act.

"15. That any undertakings which may be authorised by private Acts for the supply of electricity be subject to the conditions contained in this Act."

The Committee stood adjourned until the 8th of June, to receive and consider amendments not contravening the principles of the reductions at which they have arrived.

Invalid Bed.—Mr. Isaac D. Johnson, of Kennett Square, Pa., has patented an improved invalid bed. This invention embraces improvements which conduce materially to the conveniences of the bed and comfort of the invalid. Among these may be mentioned a sliding frame with pivoted supporting bars and balancing devices for raising and lowering a hinged head section of the bed; a spring bolt and notched bar for use in connection with the cord which is employed to raise said head section, whereby, on releasing hold of the cord, the head section is locked in position, and is unlocked by the act of pulling on the cord to adjust the section; a stretcher, made of canvas or other strips, provided with tightening devices, and, in combination with the stretcher, a subjacent vertically adjustable mattress adapted to pass within the stretcher; a commode made capable of a longitudinal sliding adjustment beneath the stretcher and having special openings in it for removing the utensils and other purposes: and various other useful appendages.

RECENT AMERICAN AND FOREIGN PATENTS.

An improved *cloth-cutting machine* has been patented by Mr. Nathan B. Rafelson, of New York city. This invention consists in a press cutter frame provided with rollers which move upon a track along the sides of a table of any desired length and a combination of cutting blades, by which an entire pattern may be cut by a single operation. The invention further consists in an arrangement of spiral springs for preventing the cloth from being disarranged by the withdrawal of the knives.

A *horse collar pad* has been patented by Mr. Frederick F. Kanne. of Waterville, Minn. This improved pad can readily be applied to or removed from a collar; only the lugs of the arched frame rest on the horse's neck, and they are covered by a double thickness of leather. The pad will adapt itself to the neck of any horse, and the collar cannot become misplaced in its seat in the curved frame. There is an air chamber for the free circulation of air between the curved arched frame and the pad.

An improvement in *end gates* for wagons has been patented by Mr. Stephen D. Davis, of Malvern, Iowa. This invention relates to end gates for waggons which are adapted to be let down to form boards or extensions to facilitate the use of a shovel in the removal of corn, potatoes, &c., with which the wagon may be loaded.

An improvement in that method of *closing bottles and jars* in which the stopper is made in two parts with holes through both parts that are closed by bringing these two parts together, has been patented by Mr. James D. Foster, of London, Ky. It consists in combining with the neck of a jar two circular disks of equal diameter having flat sides with holes through them, which holes are arranged out of registration, and one of which disks is forced down flat upon the other to close the holes in the same and form practically but a single stopper, and with which two disks is preferably combined a top coating of wax or cement.

Machine for *spinning and reeling silk*, patented by Mr. Joseph E. Tynan, of Paterson, N.J. The usual process is to spin or twist two or more threads of unspun silk to form a single warp, which is afterward reeled into skeins by a separate machine. The object of this invention is to perfect both the spinning and reeling mechanism, and further, to combine them in one machine, so that the operations can be successively performed without the time and labour required for spooling the silk after spinning.

An improved *car coupling* has been patented by Mr. Moses Robeson, of Galena, Kan. The object of this invention is to provide a car coupling by means of which two cars can be coupled together and uncoupled without running them together while the link is being adjusted, thereby avoiding danger to life and limb in coupling cars.

An improvement in *electric lamps*, patented by Mr. Ludwig K. Böhm, of New York city, relates to electric lamps of the arc type, in which the carbons are contained in vacuum chambers of glass. The object of this invention is to provide for convenient renewal of the carbon and insure uniform feed of the positive carbon to compensate for waste, to which ends the invention consists in a carbon holder of novel construction, combined with a separable vacuum chamber. The same inventor has also patented an improvement in electric lamps of the class in which an incandescing carbon is employed in a vacuum chamber, the object being to allow the use of straight carbons and to facilitate the introduction of the carbons and sealing of the wires.

Mr. Lambert F. Fouts, of Greenfield, Iowa, has patented an improved *switch board* for use in connection with annunciator or burglar alarms. The several doors and windows of a dwelling, hotel, or other structure, or any other desired points, are connected in a closed circuit with a battery, an alarm, and the switch board, the latter having a pivoted button and fixed post for each door or point in the circuit. When a "break" is made—as, for instance, when a door is opened—it may be located by moving one or more of said buttons until the restoration of the circuit through branch wires connected with the aforesaid posts and the consequent arrest of the alarm give the required indications.

Gate.—Messrs. Josiah Austin and Rossco Chamberlain, of East Liberty, Ohio, have patented a gate which can be opened and closed by the vehicle which passes through it without compelling the driver to alight. It is an improvement upon that form of automatic gate in which a toothed bar acts upon a set of segmental teeth connected with the gate post to open or close the gate by the longitudinal movement of the sliding toothed bar, which is actuated by rods on opposite sides of the gate connected with double-cranked shafts that are struck and deflected by the vehicle wheels.

An improved *axle-box cover* has been patented by Mr. Daniel A. Bolt, of Stillwater, Minn. The object of this invention is to provide an efficient, easily-operated, and cheaply constructed lid or cover for the axle boxes of railroad and similar trucks, and one having such construction and arrangement that it will close from the jar or motion of the truck if accidentally left open. The invention consists of side pieces or facings, which are cast with or secured upon the face of the box, formed with the grooves or ways in which the cover or lid moves, and with projections at their upper ends for limiting the upward movement of the cover or lid, in combination with the lid formed with a bar or rod across its lower end, the sides of the lid being formed with cams or wedge-shaped projections to correspond with similar projections formed in the grooves or ways to hold the lid tightly in place when closed and to prevent all rattling of the lid when the cars are in motion.

An improvement in *breech-loading firearms* has been patented by Mr. Henry Scott, of Birmingham, England. This invention has reference to breech-loading small arms of the kind commonly called "drop down guns," and the invention consists in the combination of parts for cocking the concealed or internal hammers of the guns, and in the arrangement of the parts of safety apparatus for preventing the accidental discharge of the guns.

A gutter holder, patented by Mr. William E. Brown, of Irving, Kan, consists in the peculiar construction and arrangement of the parts, whereby the sections of a gutter are clamped together and held straight and even while being soldered. The holder is adapted to clamp gutter sections of different diameters.

A cotton gin attachment, patented by Mr. Joseph Kopfler, of Amite City, La., is an attachment to cotton gins to remove motes, sand, &c., from the cotton while being ginned; and it consists in the combination with the brush cylinder of the frames secured together and provided with a horizontal series of slats and an upwardly inclined series of slats.

Mr. Henry R. Robbins, of Baltimore, Md., has patented an improvement in passenger coaches for street travel, the object of which is to house or close in the *pendent steps at the end of the coach*, and provide also a door which, while it perfectly closes the body of the coach, will not be in the way of passengers in getting in and out of the coach.

Messrs. James Dempster and Henry Holcroft, of Media, Pa., has patented an improvement in carding engines which consists in combining with the carding cylinder a cylinder having a set of rings of card cloth and one or more strippers which have a longitudinally reciprocating movement between the carding cylinder and ringed cylinder, together with mechanism for actuating this stripper cylinder, whereby all of the fleece to the carding cylinder is transferred to a single cylinder having rings of card cloth, by the lateral distribution of the fleece as effected by the endwise movement of the stripper.

Steam boilers, patented by Mr. George F. Major, of Brandy Station, Va., relate to tubular boilers in which the tubes are arranged side by side; and it consists in the peculiar construction of a tube having a reduced end, and the alternately reversed arrangement of two or more series of such tubes, each series of which is connected with a drum at each end, with the drums so disposed as to form flues between the series of tubes.

A station indicator, patented by Messrs. William H. Hackney, of Laramie County, Wyoming Territory, and Edward G. Hudson, of Lincoln, Ill., consists in the peculiar means for reversing the movement of the ribbon when wound up. An intermediate shaft is placed between the two shafts carrying the belt or ribbon, which intermediate shaft has a cog wheel adapted to engage with cog wheels on the ribbon shafts alternately by the lateral shifting of this intermediate wheel, the wheels on the ribbon shafts being set in different planes to permit this action, and the intermediate wheel being shifted by the longitudinal movement of the shaft, which is held by a latch entering one or two circumferential grooves in the shaft. The improvement also consists in providing the gear wheel which drives the ribbon shaft with a set of tappets to act on a spring-arm bearing a hammer which strikes a bell.

Wheel Tyres.—Mr. James E. Sarjent, of Brownville, Col., has patented a device for holding, upsetting, and welding tyres for vehicle wheels, where they require to be shortened. It consists of two strong clamps having set screws, and adapted to be fastened to the tyre on each side of the point where it is to be upset or "jumped" together. These clamps are provided with seats that receive the centres or bearings of a large yoke piece which extends from one of the clamps to the other. One of these centres is a screw provided with a handle, by turning which the one clamp is forced toward the other and the tire held by them is upset, so that it may be rapidly finished with a solid weld.

A pneumatic lever for mechanical musical instruments, patented by Mr. Alonzo Durkee, of New York city, is to provide an improved device for receiving air forced, under pressure, from the air reservoir or chest of a wind musical instrument which is mechanically played or controlled by means of one or more strips or sheets of paper or other suitable material perforated to represent the different notes or sounds it is desired to produce and caused to automatically pass over air ducts, which, accordingly as they are opened by the perforations in the paper that has a valvular action relatively to them, cause the reeds or pipes to be played as required, and to transmit the pressure to the corresponding pallet or valve, which is thereby opened to permit the escape of air from the pressure chamber to vibrate the reeds or tubes of the instrument.

A cuff holder has been patented by Mr. Joseph F. Guignon, of St. Louis, Mo. This invention relates to women's cuff holders; and its object is to do away with pinning the cuff to the dress sleeve, which tends to break and otherwise injure the cuff. It consists in a band of elastic material, which is buttoned to the cuff and allowed to expand against the inside of the dress sleeve by releasing a catch.

Mr. George M. Rogers, of Wapakoneta, O., has patented a novel form of *car coupling* designed to couple with cars using the ordinary link without danger to the employes of the train.

BRITISH 21 JY 82 M